PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.

Vol. 114, No. 9 Thursday, February 26, 1942 Price Ten Cents

# Kimberly-Clark Increase Hourly Wage Rate

## Men and Women Employees In Company's Mills Granted Pay Raise—Basic Rate In All Wisconsin Mills Now 71 To 74 Cents Per Hour—Paper Mills Assessed Tolls—Other Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., February 23, 1942—Pay increases for all Wisconsin mills of Kimberly-Clark Corporation went into effect Sunday, February 22, following negotiations between management and the unions at the company's office at Neenah, Wis. last week. Hourly paid workers were advanced three cents per hour for women and four cents per hour for men.

The boost brings the basic rate for women at the Lakeview and Badger-Globe mills at Neenah and the mill at Kimberly, Wis. up to 56 cents per hour, and in the Atlas mill at Appleton, Wis., and the Kimlark plant at Neenah to 54 cents. The increase for men brings the basic rate in all Wisconsin mills to 71 cents per hour for day workers and 74 cents for shift workers.

Announcement of the new scale was made jointly by George J. Ritten, president of the Wall Paper Workers Union of the Fox River Valley; O. K. Hannemann, president of the Paper Mill Workers Union at Kimberly; Dorward Schomisch, president of the Lakeview Independent Union, and William Dickson, president of the Paper Mill Workers Union, Niagara, Wis.

### Paper Mills Assessed Tolls

Paper mills and power plants along the Wisconsin River were assessed tolls of $102,160 for the last six months of 1941 by the Wisconsin Valley Improvement Company, according to a schedule approved by the Wisconsin Public Service Commission. This represents costs for operation of a series of control dams and reservoirs.

Tolls were as follows: Wisconsin Public Service Corporation: Eagle River dam, $168; Hat Rapids dam, $1,213; Jersey dam, $416; Tomahawk dam, $1,401; Grandfather dam, $14,918; Alexander dam, $3,688; Merrill dam, $322 Wausau dam, $4,431.

Rhinelander Paper Company, $1,690; Tomahawk Pulp Company, $1,204; Tomahawk Kraft Paper Company, $3,091; Marathon Paper Mills Company, $3,325; Mosinee Paper Mills Co., $2,653.

Consolidated Water Power and Paper Company: Stevens Point dam, $5,409; Biron dam, $7,489; Wisconsin Rapids dam, $9,861.

Wisconsin River Paper and Pulp Company, $6,676; Whiting-Plover Paper Company, $166; Wausau Paper Mills Company, $653; Nekoosa-Edwards Paper Company: Centralia dam, $4,689; Port Edwards dam, $5,257; Nekoosa dam, $5,399.

Wisconsin Power and Light Company: Wisconsin Dells dam, $7,056; Prairie du Sac dam, $11,287.

### Safety Meetings Largely Attended

More than 800 attended the second of a series of safety schools sponsored by paper mills and allied industries of Neenah and Menasha, Wis. It was held February 17 at the Menasha high school auditorium with Victor L. Short, president of the Institute of Human Science, New York City, as the speaker. He spoke largely concerning united efforts on the part of all to win the war, saying his remarks apply as well to safety as all of life.

Walter Strong of the Marathon Paper Mills Company was chairman of the meeting. The Lakeview mill band of Kimberly-Clark Corporation furnished a concert.

The closing meeting of the series will be held March 24 at the Neenah high school, with the Rev. T. Parry Jones of Sheboygan, Wis. as the speaker.

## Fox River Signs Agreement

Negotiations in progress for several weeks were completed last week by the Fox River Paper Corporation, Appleton, Wis., and the Appleton local of the International Brotherhood of Papermakers covering wage and working agreements for the year 1942. A general increase of four cents per hour in wages was granted, retroactive to January 1, 1942. Employees with two or more years of service are given an annual vacation of one week with pay.

The new contract includes the standard union membership clause, providing that all employees who are members of the union must maintain their membership if they wish to remain on company payrolls. It does not compel workers to join the union.

# Canada Concentrates on Saving Waste

## Many Newspapers Publish Appeal To Public To Conserve Supply of Paper—Report Stresses Need of Utmost Efficiency In Operating Wrapping Paper Mills — Pulp Mills Are Using Less Chlorine.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 23, 1942—Concerted efforts are now being exercised in Canada to conserve the usage of all forms of paper and to salvage used paper. Many newspapers in Canada, at the request of the Department of National War Services are making use of the following appeal, adapted from the British press to Canadian conditions: "Please do not destroy this paper. It is needed in Canada's war effort. Bundle your old newspapers and give them to your Salvage Committee, or sell to the local dealer."

C. H. Fetherstonbaugh, in a report on behalf of the Wrapping Paper Section of the Canadian Pulp and Paper Association, recently stated that the Canadian wrapping paper mills recognize that they must operate with the utmost of efficiency and equitably distribute wrapping paper whereby war requirements will be served first, followed by essential civil requirements and requirements of Empire countries.

### Consumers Put on Allotment Basis

"To distribute the available tonnage for 1942 in an equitable manner," he says, "customers have been put on an allotment basis, there has been an elimination of unnecessary colors and uneconomical weights, serious study is being given to the devising of ways and means to discourage waste of wrapping paper or the use thereof for non-essential purposes, and a committee has been appointed which is empowered to see that the government and war requirements are served first. The wrapping paper mills are striving to the best of their ability to do their part in the first and prime objective of today, namely, the winning of the war."

The attitude of the book and writing paper mills is along the same lines. They have voluntarily and in collaboration with the merchant distributors effected a number of reductions in the sizes, weights and colors of the various grades of paper, several hundred items being discontinued. They have also reduced substantially the use of chlorine for bleaching purposes. A revision of the packing and wrapping method has been undertaken to further standardize and effect economies.

### Expanding Production of All Kinds of Pulp

The chemical pulp mills promptly, and with a minimum of dislocation and inconvenience co-operated with the Government by reducing the use of chlorine so that this material might be released for war purposes. Owing to the immensely increased demand for their product, resulting from the war, they have brought the "hidden resilience" of the industry into realization. They stepped up production in 1939 by 24.9% over the previous year, by 61% in 1941, and by 30% in 1941, when their exports had a value of about $76,000,000, of which by far the major part was United States funds. Although 1941 exports of sulphite pulps to the United Kingdom were some 40% in excess of 1940, during the same period exports to the United States were also increased 33%. Chemical pulp prices on a contract basis have remained unchanged since July 1, 1940, and continue at this same level through to March 31st next. Requirements from both the Canadian and British Governments for special grades of pulps for essential war needs have been fully and promptly met by voluntary arrangement within the industry, whereby those mills best adapted to the manufacture of these grades produced the entire quantity needed and were compensated by tonnage of other grades from those mills whose quota they produced.

As to the mechanical pulp mills, owing to the shortage in ground pulp which developed in 1941, they put "forced draft" production into force wherever possible to meet demands in the United States and Canada, and expect to keep up maximum production throughout the present year.

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## Give Service Awards at Deferiet

DEFERIET, N. Y., February 16, 1942—About 150 employees of the St. Regis Paper Company and Taggart Corporation were guests of honor at a banquet held here this week at which service awards were presented to those who have had twenty-five or more years of service. Following the banquet the employees were addressed by Joseph Quinlan, traffic manager; Edward Marshall, superintendent of the Deferiet mill; Clifford C. Wenzel, personnel director of the St. Regis mills in Northern New York, and Lyman Beeman, general superintendent of the company mills.

Those from the Oswego branch receiving gold pins were Louis N. Brenner, plant manager of the manufacturing division, David Fleishman, William Peterson and Edwin Nessling. Mr. Brenner entered the employ of the Western Valve Company, Chicago, in 1909 and was with that concern until its purchase by the Bates Valve Corporation, coming to this section in 1932. Mr. Nessling, superintendent of the machine shop, was also with the Western Valve Company, joining the concern in 1916 and going to the Oswego plant in 1932. Mr. Fleishman entered the employ of the Bates Valve in 1912, serving as general manager of the Chicago division. In 1927 he went to Oswego to supervise the erection of the bag department at the Taggart plant and to take charge of the multi-wall bag production. Until recently he was manager of the western division and is now associated with the engineering division of the St. Regis Company. Mr. Peterson started with Bates Valve in 1916 and went to the Oswego plant in 1930 where he is connected with the engineering department.

The Oswego division, employing about 165 persons, is now engaged in defense production and part of the plant is operating on a twenty-four hour basis. Announcement was made that the entire plant will probably be soon running at capacity schedules.

# News of the Philadelphia Paper Market

## Paper and Cordage Association Holds Monthly Meeting and Announces Appointment of Various Committees—Franklin Paper Co. Appointed Direct Agents For New Type of Black-Out Paper Board

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Penna., February 23, 1942—The regular monthly meeting of the Philadelphia Paper and Cordage Association was held on Friday last with luncheon at Kugler's Chestnut street restaurant. President Harry Smith of Thomas W. Price Company, presided. The meeting was a friendly get-together with round table discussion of the problems confronting the paper business generally, with particular reference to the subject matter of the various sessions at the Convention in New York City.

President Smith announced the appointment of the various committees as follows:

Finance committee—chairman, Frank Kurz, Whiting Patterson Co.; Harry Platt, Denney Tag Company, and Jack Shinners, Acme Specialty Sales Company.

Membership committee—chairman, Jack R. Howarth, J. R. Howarth Paper Company; Erwin Brown, J. P. Lewis Company, and Carroll Gardner, Groveton Paper Company.

Golf committee—chairman, E. L. Richards, Buffalo Envelope Company; Butler Smythe, J. L. N. Smythe Company; Morgan Thomas, Garrett-Buchanan Company; F. W. Hastings, American Writing Paper Company; H. H. Hanson, W. C. Hamilton & Sons; Arthur Sherrill, American Woodboard Company; J. Howard Bancroft, Independent Twine and Yarn Company; S. Brandt Defarges, Jessup & Moore Co.; George Hoffner, S. Walter, Inc.; George F. Corse, Dill & Collins, Inc.; Edwin Weihenmayer, Jr., Jessup & Moore, Inc.; Frank I. Brower, Atlantic Gummed Products Corp., and Frank O'Neill, Paper Manufacturers, Inc.

Entertainment committee—chairman, E. K. Lay, E. K. Lay Co., and George K. Hooper, Hooper Paper and Twine Company.

Publicity committee—chairman, Harry Platt, Fred I. Brower and William Peterson of E. J. Spangler Company.

Golf committee chairman E. L. Richards announced that seven tournaments will be conducted this summer at various clubs in the Philadelphia area, and arrangements have been made to extend guest privileges to members of the association by a number of the golf clubs, making it possible for them to play golf at many of the private clubs.

### Franklin Paper Co. Appointed Agents

Franklin Paper Company with offices in the Harrison Building, has been appointed direct selling agents for a new type of blackout board. Mr. Hillegas of this company reports a big demand for this paper board and just recently booked an order for one large contractor in Philadelphia for fifty carloads, to be used in three industrial plants. The board, which is about ⅛th" thick, is composed of heavy layers of fibre outside, the inside consisting of a mineral aggregate with asbestos binder and an air cushion, which prevents glass from breaking; it will not warp and is strictly fireproof. It can be used for outside protection as well as inside, thus assuring the maximum amount of ease in putting it up and taking it down. Stocked in sizes of 30 and 36" wide and 4 and 5-foot lengths it comes in two weights .090 and ⅛th"; it can also be made in much heavier weights and longer lengths on special orders. Its use is not confined to blackout purposes, being successfully used for outdoor signs, taking the place of tin, and because of its insulating properties it can also be used in place of sheathing board for roofing, etc., and has proven a good substitute for plywood for shipping cases.

## Great Lakes Gets Concessions

[FROM OUR REGULAR CORRESPONDENT]

OTTAWA, February 16, 1942—Finance Minister Ilsley tabled in the House of Commons this week an agreement giving special tax concessions to Great Lakes Paper Company, Ltd., of Fort William, under the War Exchange Conservation Act of 1940. An agreement was reached between the company and the government under which the company is to carry out remodeling and expansion of plant, and will enter into contracts for sale for United States dollars of as much as possible of its added output. In return the government provides that for taxation purposes a special depreciation allowance amounting to one-third of the cost of new depreciable assets during each of the years 1941, 1942 and 1943.

The company estimated the changes in its plant mentioned in the agreement would bring in about $1,000,000 a year more United States dollars. It said it could not see the way clear to carry out the expansion without tax concessions because of the "risks involved in price fluctuations and the probable disappearance of the market after the war."

The agreement was signed for the company by President W. Earl Rowe and Secretary Charles England, and for the government by Mr. Ilsley. The agreement was dated February 3, 1942.

## A. B. Tucker Heads Association

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., February 23, 1942—Albert B. Tucker, secretary-treasurer of Parker, Thomas & Tucker Paper Company, was elected president of the Fine Paper Association at the annual meeting held last week. J. C. Marvin, vice-president of Bermingham & Prosser Company was elected vice-president and W. N. Gillet, president of the Chicago Paper Company, was reelected secretary. Carl M. Braatsch, treasurer of the Chicago Paper Company, was reelected treasurer. To the board of directors personnel was added the name of B. J. Frelinger, general manager of the J. W. Butler Paper Company.

The meeting, aside from election of officers, was devoted to a review of the past year and an analysis of the many problems confronting the industry in the months to come.

# Government Paper Bids and Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., February 25, 1942—The Government Printing Office has received the following bids for 1,101,772 pounds of cream bristol in 33 inch rolls: Whitaker Paper Company, 5.5 cents (600,000 pounds only); and R. P. Andrews Paper Company, 5.99 cents (500,000 pounds only).

For 320,000 pounds of 34 x 44 white sulphite writing paper: Eastern Corporation, 7.275 cents; Whitaker Paper Company, 7.08 cents; R. P. Andrews Paper Company, 6.93 cents; Cauthorne Paper Company, 7.5 cents; and Barton, Duer & Koch Paper Company, 7.4 cents.

For 6,475 pounds of 75% rag, 21 x 32 blue ledger paper: Wilcox-Walter Furlong Paper Company, 21 cents; Walker Goulard Plehn Company, 23.25 cents; Barton, Duer & Koch Paper Company, 21.5 cents; R. P. Andrews Paper Company, 23.73 cents.

For 77,600 pounds of 50% rag, 32½ x 42 buff index paper: Collins Mfg. Company, 17.25 cents; Walker Goulard Plehn Company, 17.25 cents; Barton, Duer & Koch Paper Company, 15.38 cents; and Paper Corp. of U. S., 17.25 cents.

For 200,000 pounds of white sulphite writing paper in 38 inch rolls: Whitaker Paper Company, 6.83 cents; R. P. Andrews Paper Company, 6.69 cents; Paper Corp. of U. S., 7.14 cents; Barton, Duer & Koch Paper Company, 7.05 cents; and Northwest Paper Company, 7.03 cents.

For 160,000 pounds of white sulphite writing paper in 32 inch rolls: Whitaker Paper Company, 6.83 cents; R. P. Andrews Paper Company, 6.69 cents; Paper Corp. of U. S., 7.14 cents (80,000 pounds only); Marquette Paper Company, 7.5 cents; and Northwest Paper Company, 7.03 cents.

For 12,000 pounds of 25% rag, 22 x 34 salmon bond paper: Old Dominion Paper Company, 14.65 cents; Mudge Paper Company, 15.7 cents; and R. P. Andrews Paper Company, 14.65 cents.

For 80,000 pounds of white sulphite writing paper in 24 inch rolls: Northwest Paper Company, 7.03 cents; Whitaker Paper Company, 6.83 cents; Cauthorne Paper Company, Inc., 7 cents; R. P. Andrews Paper Company, 6.79 cents; Stanford Paper Company, 7.25 cents; Marquette Paper Company, 6.9 and 7.5 cents.

For 172,500 pounds of 32 x 42 yellow sulphite writing paper: Northwest Paper Company, 8 cents; Whitaker Paper Company, 7.77 cents; R. P. Andrews Paper Company, 7.79 cents; Marquette Paper Company, 8.6 cents.

For 249,000 pounds of 35 x 45 machine coated book paper: Newton Falls Paper Mill, 6.85 cents; Mead Sales Company, Inc., 7.272 cents; R. P. Andrews Paper Company, 6.664 cents; Whitaker Paper Company, 7.12 cents and Barton, Duer & Koch Paper Company, 6.2 cents.

For 19,902 pounds of 50% 32½ x 42 salmon ledger paper: Collins Mfg. Company, 17.75 cents; Carpenter Paper Company, 17.65 cents; Walker Goulard Plehn Company, 17.05 cents; Mudge Paper Company, 19.77 cents; Whitaker Paper Company, 17.65 cents.

For 17,027 pounds of 50% rag, 32 x 48 white ledger paper: Wilcox Walter Furlong Paper Company, 17 cents; Carpenter Paper Company, 16.9 cents; Walker Goulard Plehn Company, 16.1 cents; Mudge Paper Company, 18.94 cents; and Whitaker Paper Company, 16.9 cents.

### Paper Awards

R. P. Andrews Paper Company has been awarded the contract for furnishing the Government Printing Office with 30,762 pounds of 25% rag, 32 x 42 yellow bond paper at 18.05 cents. Other paper awards recently announced by the Printing Office include the following.

The Andrews Paper Company will also furnish 6,600 pounds of 25% rag, 28 x 34 pink bond paper at 18.05; 19,050 pounds of 25% rag, same size white bond paper at 17.15 cents and 19,000 pounds of 25% rag, same size pink bond paper at 18.05 cents.

Paper Corp. of U. S. will furnish 6,675 pounds of 34 x 63½ white sulphite bond paper at 9.5 cents. Whitaker Paper Company will furnish 57,400 pounds of 32 x 42 buff sulphite writing paper at 8.14 cents and the same firm will also furnish 115,000 pounds of 32 x 42 blue sulphite writing paper at 8.14 cents.

Stanford Paper Company will furnish 13,000 pounds of 50% rag, 21 x 32½ white ledger paper at 16.15 cents and Walker Goulard Plehn Company will furnish 40,750 pounds of 25% rag, 28 x 34 white bond paper at 13.65 cents. R. P. Andrews Paper Company will furnish 400,000 pounds of white sulphite writing paper in 32 inch rolls at 6.79 cents. Same firm will also furnish 128,000 pounds of 34 x 44 yellow sulphite writing paper at 7.79 cents. Marquette Paper Company will furnish 45,600 pounds of 22¼ x 32¼ M.F. book paper at 6.95 cents and W. L. Jones Inc., will furnish 60,000 pounds of No. 2 Kraft wrapping paper in 24 inch rolls at 4.75 cents less 2%. Same firm will also furnish 25,000 pounds same in 48 inch rolls at 4.75 cents less 2%, and 10,000 pounds same in 36 inch rolls at 4.75 cents less 2%.

Import Paper Company will furnish 150,000 pounds of white sulphite manifold paper in 24 inch rolls at 8.45 cents. Paper Corporation of U. S. will furnish 7,680 pounds of 100% rag, 33 x 34 white parchment deed paper at 24.8 cents. Marquette Paper Company will furnish 500,000 pounds of offset book paper at 7.15 cents and the Whitaker Paper Company will furnish 404,189 pounds same 39 x 56½ at 7.3 cents. Same firm will also furnish 508,076 pounds same 39 x 62¾ and 39 x 56½ at 7.3 cents.

Graham Paper Company will furnish 107,800 pounds of 50% rag, 36 x 50 litho finish map paper at 16 cents and the Whitaker Paper Company will furnish 112,250 pounds of 50% rag, 30 x 50 litho finish map paper at 20 cents. Same firm will also furnish 215,500 pounds of 50% rag, 30 x 48 litho finish map paper at 20 cents. R. P. Andrews Paper Company will furnish 170,000 pounds of white sulphite writing paper in 24 inch rolls at 6.79 cents.

Paper Corporation of U. S. will furnish 40,000 pounds of 29 x 41 buff offset paper at 9.2 cents, and the Old Dominion Paper Company will furnish 788,000 pounds of 25% rag, 38 x 48½ mimeograph paper at 10.35 cents. Stanford Paper Company will furnish 16,050 pounds of 22½ x 37 emulsified paper at 11.29 cents and the Paper Corp. of U. S., will furnish 30,000 pounds of 25% rag, 8 x 14 white mimeograph paper at 11.5 cents. Paper Corporation of U. S. will

furnish 67,500 pounds of 25% rag, 8 x 10½ white mimeograph paper at 11.5 cents.

Whiting-Patterson Company will furnish 90,000 pounds of 25% rag, 32 x 42 white bond paper at 13.9 cents and the Cauthorne Paper Company will furnish 160,000 pounds of 34 x 44 white sulphite bond paper at 7.5 cents. Paper Corp. of U. S. will furnish 88,500 pounds of 25% rag, 23 x 36 white bond paper at 14.44 cents and Barton, Duer & Koch Paper Company will furnish 30,000 pounds of 100% rag, 38 x 48 cream white antique book paper at 20 cents. R. P. Andrews Paper Company will furnish 1,134,000 pounds of 40½ x 53 safety sulphite writing paper at 7.03 cents and the Marquette Paper Company will furnish 500,000 pounds same paper, same size at 8.57 cents. Also Barton, Duer & Koch Paper Company will furnish 250,000 pounds same paper and size at 7.15 cents.

R. P. Andrews Paper Company will furnish 1,000 sheets of 20½ x 26 antique rhododendron cover paper at $39.65. Graham Paper Company will furnish 104,000 pounds of No. 2 Kraft wrapping paper 30 x 36 at 5 cents and the R. P. Andrews Paper Company will furnish 40,950 pounds of 24 x 38 white sulphite ledger paper at 8.05 cents. Same firm will also furnish 14,625 pounds of 25% rag, 24 x 38 salmon bond paper at 14.6 cents.

Edward Stern Company will furnish 1,725 pounds of 25 x 38 white paper for Optak printing at $163.01 and the R. P. Andrews Paper Company will furnish 320,000 pounds of 34 x 44 white sulphite writing paper at 6.93 cents. Same firm will also furnish 200,000 pounds same in 38 inch rolls at 6.69 cents. Andrews Company will also furnish 160,000 pounds of white sulphite writing paper in 32 inch rolls at 6.69 cents and Walker Goulard Plehn Company will furnish 25,000 pounds of 50% rag, 21 x 32 pink manifold paper at 22.5 cents.

Marquette Paper Company will furnish 57,500 pounds of 21 x 33 white sulphite manifold paper at 12.5 cents and the Whitaker Paper Company will furnish 100,000 pounds white sulphite writing paper in 36 inch rolls at 9.6 cents. Cauthorne Paper Company will furnish 175,000 pounds of white sulphite manifold paper in 24 inch rolls at 9.9 cents and the Mudge Paper Company will furnish 38,400 pounds 38 x 48 M.F. book paper at 7.4 cents.

R. P. Andrews Paper Company will furnish 192,600 pounds of 43 x 64 white sulphite writing paper at 6.85 cents and Wilcox-Walter Furlong Paper Company will furnish 6,475 pounds of 75% rag, 21 x 32 blue ledger paper at 21 cents. Barton, Duer & Koch Paper Company will furnish 77,600 pounds of 50% rag, 32½ x 42 buff index paper at 15.38 cents.

R. P. Andrews Paper Company will furnish 56,100 pounds of white sulphite writing paper in 48 inch rolls at 6.55 cents and 496,692 pounds of same 36¾ x 48 at 6.95 cents. Same firm will also furnish 89,700 pounds same 48 x 73½ at 6.95 cents and the Whitaker Paper Company will furnish 158,090 pounds 40 x 63 white sulphite writing paper at 6.91 cents. Same firm will also furnish 117,725 pounds of same 40 x 26¼ at 6.91 cents and also 203,390 pounds of same 40 x 57¾ at 6.91 cents.

R. P. Andrews Paper Company will furnish 80,000 pounds of white sulphite writing paper in 24 inch rolls at 6.79 cents and the Whitaker Paper Company will furnish 172,500 pounds of 32 x 42 yellow sulphite writing paper at 7.77 cents.

## Heads Graham Paper Co.

H. W. Henry was elected president of the Graham Paper Company, St. Louis, Mo., at its annual meeting January 28, succeeding C. W. Lewis, who retired after an active service of 47 years with the company. Mr. Henry, who is 48 years of age, served as the company's auditor for many years and during the past six years has been treasurer and a director of the company. Prior to his connection with the company, he was a partner in a well known firm of certified Public Accountants in St. Louis. Other officers elected at this annual meeting were as follows: E. G. Kerwin, executive vice president; P. A. Harris, vice president; D. French, vice president; W. H. Kniep, secretary and treasurer.

H. W. Henry

## OPA Amends Trucking Charge

Permission to charge a $1 differential for trucking of waste paper to a public siding under certain circumstances and subject to certain condition is provided in Amendment No. 6 to Price Schedule No. 30 for wastepaper, to be signed Tuesday, February 24, 1942, and becoming effective Wednesday, February 25, Price Administrator Leon Henderson announced today.

The differential is authorized for loading in all territories except in the switching district of Chicago.

The amendment also provides that when transportation of wastepaper to a buyer is in a truck owned or controlled by the seller, the seller may add a charge of not in excess of $1 per short ton, plus actual toll charges, when both the point of shipment and the buyer's premises are located in the same city, town or municipality, or at a distance of ten miles or less from each other by the shortest available public highway route. For shipments of wastepaper in the seller's own trucks to consumers not in the same city or more than 10 miles from the seller's premises the seller now may charge an amount not exceeding the lowest published carload rail rate.

The amendment affects Section 1347.10, Appendix A of Price Schedule No. 30 as amended.

## WPB Defines Pulp Inventory

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., February 25, 1942—A practicable working minimum inventory of woodpulp is defined as not in excess of a sixty-day supply by Interpretation No. 1 of Section 944.14 of Priorities Regulation No. 1, issued yesterday by the Director of Industry Operations.

The sixty-day supply, as used in the interpretation, is to be based on current method and rate of operation during any period of ninety continuous working days of the previous six months.

Inventories of pulp held for the manufacture of products for Ordnance purposes or for delivery under the Lend-Lease Act, are exempt from the restrictions imposed by this interpretation.

The effect of today's interpretation will be to assure a more equitable distribution of wood pulp by prohibiting deliveries to companies whose inventories exceed a sixty-day supply.

944.14. The following official interpretation is hereby issued by the Director of Industry Operations with respect to Section 944.14 of Priorities Regulation No. 1 as amended December 23, 1941.

Any inventory of any grade of wood pulp in excess of sixty days' supply of that grade, on the basis of current method and rate of operation during any ninety continuous working days of the previous six months, stored either at a plant or in separate warehouses, shall be deemed to be in excess of a "practicable minimum working inventory": provided, however, that this interpretation shall not apply to pulp held for the manufacture of products for Ordnance purposes or to pulp held for delivery under the Lend-Lease Act of March 11, 1941.

## Simplified Practice for Waxed Paper

A proposed Simplified Practice Recommendation for waxed paper, moulded wood pulp and wood types of food trays or dishes has just been submitted to all interests for approval and comment, according to an announcement of the Division of Simplified Practice, National Bureau of Standards.

This simplification program developed in cooperation with the industry, will result in the (1) elimination of food trays or dishes too light in weight to give adequate service, (2) food trays that are excessively heavy over and above requirement, and (3) the elimination of unnecessary sizes in meager demand. It is expected that this recommendation, if adopted and adhered to by the industry, will result in the conservation of materials. Calculated on the basis of square footage of container board used in each process of packing, a saving is conservatively estimated at 5,000,000 square feet of board equal to 650,000 pounds of board.

An advisory Standing Committee of the industry will be appointed to take charge of this simplified practice recommendation to keep it up to date and in line with best practices in the industry.

The recommended standards, when approved, will be made effective on a date to be announced later by the Division of Simplified Practice.

Mimeographed copies of the proposed recommendation may be obtained upon request to the Division of Simplified Practice, National Bureau of Standards, Washington, D. C.

## A. F. Miller Goes with OPA

Albert Fullerton Miller, formerly a vice president of the Central Ohio Paper Company, Columbus, Ohio, has severed his relations with that company

ALBERT FULLERTON MILLER

and is now in the fine paper division of the OPA in Washington. Mr. Miller in his new position has a rating of a senior specialist.

## Sales Club Gives "Quiz" Program

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., February 23, 1942—F. W. Sinsabaugh, purchasing agent for Bradner, Smith & Company, well known Chicago paper jobbers, was one of the four "wise men" in an "Information Please" program sponsored by the Chicago Sales Executives Club and Purchasing Agents Association and held at the Hotel Sherman on February 19. Mr. Sinsabaugh was one of the four experts representing the purchasing agents while the sales executives present four question answerers including A. G. Shennan, vice president of the International Tag and Salesbook Company and H. C. Buell, general sales manager of the American Bank Note Company. Chief quizzer was B. B. Countryman of the Minnesota Mining and Manufacturing Company. The questions brought out much available and valuable information on sales procedure and the problems of purchasing agents in a unique and interesting manner.

## U. of M. Paper Men Meet

The annual luncheon of the University of Maine Men in the Paper Industry was held at the Commodore Hotel, New York City, Wednesday noon, February 18. F. A. Soderberg, of the General Dyestuff Corporation, 435 Hudson street, New York City, was elected chairman of the group for the ensuing year. Approximately seventy Maine graduates attended this meeting and listened to brief talks by Dr. McKee of Columbia University, Dr. Nolan of the University of Maine, and R. G. Macdonald of TAPPI.

## Ohio Discusses Electron Microscope

The Ohio Section of TAPPI met at the Anthony Wayne Hotel, Hamilton, Ohio, on February 20, 1942. Following a dinner served to 40, Dr. George R. Sears, research assistant of The Institute of Paper Chemistry, discussed the work he has been doing on the electron microscope.

Dr. Sears started the discussion by comparing the optical and electron microscopes with respect to their optical systems and constructions. He then went on to explain how the use of the electron microscope permits a greater resolving power to be obtained and hence a greater useful magnification. He pointed out that theoretically by using electrons as a source of light immense magnifications may be reached if the focusing power of the magnetic "lenses" could be improved to the quality available in the best optical lenses. At present, useful magnifications of about 25,000 are obtained.

During the discussion, Dr. Sears showed slides illustrating properties of several different material including fillers, pigment dyes, fibers, size, etc. He pointed out that at present they are trying to determine what field in the pulp and paper industry might be studied to the best advantage at the present time.

The fact that those assembled found the talk to be very interesting was evidenced by the large number of questions asked Dr. Sears at the conclusion of his talk.

Those in attendance at the meeting were: T. Agronin, Russell Anness, John R. Athy, Marshall L. Barker, Lloyd S. Bovier, Duncan S. Brown, Howard Buechler, John E. Burdsall, John Burnett, Harry A. Cunningham, Thage Dahlgren, Leo Fleisher, L. J. Gaede, John A. Hamm, Jr., H. Heckel, Robert Herman, S. A. Hluchan, William Innes, P. T. Jerardi, Glenn C. Kimble, Arthur Kjellstrand, Edward Lum, F. S. McGee, Reno Miller, R. M. Miller, Charles R. Merriman, William Reigers, Andrew Ryfun, A. C. Salisbury, George R. Sears, R. H. G. Smith, S. A. Staege, G. H. Suhs, J. H. Syrnes, Stanley Trosset, Robert R. Weber, Sam Weber, William A. White, Jr., Samuel W. Yates, and M. A. Youtz.

## No Lost Time in Twenty-four Years

Saturday, February 7, marked the completion of 24 years of operations without a lost-time accident for the laboratory and testing stations of the Kimberly-Clark Corporation's mill at Kimberly, Wis. The last accident occurred in the department February 7, 1918, when a chemist received acid burns on his face while boiling acid in a test tube. George R. Gerritts is head of the department, while Cornelius Crowe heads the testing stations. Glen Strieby is technical director. The work is hazardous not only in the handling of materials, but in exposure to accident while gathering testing samples.

## Fire Damages Great Eastern Warehouse

BOSTON, Mass., February 23, 1942—A two-alarm fire damaged bales of newspapers, wool and hemp recently in the one-story brick warehouse of the Great Eastern Packing and Paper Stock Corporation at 2566 Washington street, Roxbury, with an estimated loss of $10,000, including that to the building.

Firemen entered the building by skylights and discovered the fire, of undetermined origin, had seared over the tops of hundreds of bales of newspapers.

## Jacob von Julin Dead

Jacob von Julin, of Helsingfors, Finland, died on February 19, at the age of 60.

Mr. von Julin was prominently identified with the wood pulp industry in Finland, being manager of the Kaukas concern and chairman of the board of the Finnish Cellulose Association. He was one of the founders of the Finnish Cellulose Association in 1918 and served continuously as chairman of its board from that year until the time of his death. Because of his unusual ability Mr. von Julin was elected to serve in many of the organizations in Finland, promoting industrial interests and relationship between industry and workers. As the representative of the Government of Finland he took part in many negotiations relating to commerce and trade with foreign countries.

Mr. von Julin, who had many friends in the pulp and paper industry, as well as among bankers and businessmen in general in the U.S.A., visited the U.S.A. several times, his first visit to this country taking place when he was in his early twenties. He was active in promoting commerce and trade between U. S. A. and Finland and was a great friend of the U.S.A.

He was a friend of former President Herbert Hoover when the latter was Secretary of Commerce, and helped to build up the industries and export trade of Finland after that country gained its independence in 1917. He visited the United States again in 1919 as head of a Finnish commercial commission, formed to establish friendly relations with American bankers and merchants. Mr. von Julin held decorations from fifteen governments.

He leaves a widow, Elsa, a son, Jacob Jr., and three daughters, two of whom, Karen and Lisen, are residents of Helsinki. The third daughter lives in Stockholm.

## Junior Association Visits M. & O. Mills

Northern Minnesota's forest resources and the paper and insulation board industries which depend upon them were studied by conservation leaders of the Minnesota Junior Association of Commerce recently on a tour which included both logging and mill operations.

Thirty-five members of the Junior Association from eight cities spent three days in the forest and at Minnesota and Ontario Paper company's paper and insulite mills at International Falls, Minn., studying practical conservation.

Application of scientific practices to timber cutting, tree planting and reforestation by natural regeneration were studied by the group whose objective was to get a better understanding of conservation practices carried on by the state and private industry in Minnesota. At the company mills they studied processes of paper and insulite manufacture, viewing the entire field of operations from the raw material to completed products.

Describing activities, at the mills were H. G. Weber, Minnesota state forester; Cy Plattes, assistant to the state commissioner of conservation; T. R. Willits and D. E. Chase, M. and O. representatives. Accompanying the JAC group, headed by Dr. Theodore R. Fritsche of New Ulm, chairman of the association conservation committee, was Basil Walters, editor of the Minneapolis Star-Journal and Tribune.

# CONSTRUCTION NEWS

**Lockland, Ohio** — The Fox Paper Company, Locke street, manufacturer of kraft, news board and other paper stocks, has approved plans for new addition to mill, comprising a one-story structure, about 100 x 125 feet, to be used primarily for storage and distribution. It is reported to cost over $40,000, including equipment. General erection contract has been let to Joseph Messingschlagar, 5350 Carthage avenue, Norwood, Cincinnati, and work will be placed under way at once.

**Gardner, Mass.**—The Sanquoit Paper Company, Inc., 354 Main street, recently organized with capital of $100,000, plans early operation of a mill in this vicinity for the manufacture of a line of paper products. Clarence P. Spofford is president, and Pauline A. Day, 21 South Main street, Templeton, Mass., treasurer and representative.

**New Brunswick, N. J.**—The Mengel Company, Quentin avenue, manufacturer of fiber and corrugated board shipping boxes and containers, etc., has begun erection of new one-story addition to plant, 60 x 200 ft., recently referred to in these columns, and proposes to complete the structure during the spring. It will be equipped for increased capacity. Cost reported over $75,000, including equipment. William M. Connolly, Sr., 14 Handy street, New Brunswick, has general contract for erection. Main offices of company are at 1122 Dumesnil street, Louisville, Ky.

**Dexter, N. Y.**—The Dexter Sulphite Pulp and Paper Company, manufacturer of wrapping, waxed and other processed paper stocks, is said to be considering early rebuilding of portion of power house at mill, recently damaged by fire, caused by sparks from generating unit. Loss reported close to $50,000, including equipment.

**Monroe, Wash.**—The Pacific Fiber Flax Association, Inc., care of William A. Eastman, 414 University street, Seattle, Wash., president, recently organized by Mr. Eastman and associates, has concluded arrangements for purchase of former milk condensary of the Carnation Company, Milwaukee, Wis., at Monroe, consisting of several one-story buildings with large floor area. New organization will take possession at early date and will remodel and equip for new fiber processing mill. Cost estimated close to $100,000, including machinery and equipment.

**Minneapolis, Minn.**—The B. F. Nelson, Manufacturing Company, 401 N. E. Main street, manufacturer of roofing papers, felts, etc., is said to be arranging for immediate award of contract for superstructure for new addition to power house at mill at 400-406 N. E. Marshall street, recently noted in these columns, and for which award has been pending for several weeks. A new boiler unit and auxiliary equipment will be installed. Cost reported over $35,000, including equipment. Frederick L. Smith, 21 East Fortieth street, New York, N. Y., is architect and engineer.

**Chicago, Ill.**—Central Paper Stock Company, 1265 West North avenue, commercial paper products, has asked bids on general contract for rebuilding of portion of three-story plant, 100 x 200 feet, location noted, recently damaged by fire. Cost about $50,000, with equipment. Work is scheduled to begin at early date. B. Albert Comm, 20 West Jackson boulevard, Chicago, is architect.

**Bogalusa, La.**—The Gaylord Container Corporation, Pulp and Paper Division, manufacturer of container liner, corrugating paper, kraft stocks, etc., has work under way on installation of a new turbine-generator and auxiliary equipment for the new No. 7 paper-making machine at the mill, and expects to have unit ready for service at early date. This is part of an expansion program which has been in progress at plant for a number of months and has included other extensions in power plant, new one-story building for storage and distribution, expansion in sulphate pulp bleaching division, two-story addition to bag and container-manufacturing unit, and other work. Entire project is scheduled for completion in near future. As previously noted in these columns, investment will approximate $5,000,000, including machinery.

**Stockton, Calif.** — The Fibreboard Products, Inc., Russ Building, San Francisco, Calif., manufacturer of fiber board and other paper board specialties, templet board, etc., has begun work on new addition to branch mill on Church street, Stockton, consisting of a one-story structure, recently noted in these colums. It will be equipped for increased capacity. Cost is reported over $85,000, including machinery. Engineers, Ltd., 225 Bush street, San Francisco, has the general erection contract. It is expected to have the structure ready for service late in the spring.

**Hull, Que.**—The E. B. Eddy Company, Ltd., manufacturer of newsprint, wrapping papers, tissue stocks, etc., has plans under way for extensions and improvements in mill. Bids are scheduled to be asked soon on general contract. Cost is reported over $50,000, including equipment.

**St. Paul, Minn.**—The American Can Company, 230 Park avenue, New York, N. Y., will complete plans soon for new plant at Como and Snelling avenues, St. Paul, to be operated, it is stated, by its recently organized subsidiary, Ammunition Container Corporation, formed to specialize in the manufacture of fiber containers for shell service. Plant will comprise a series of one-story buildings, equipped for large capacity, and several auxiliary structures for storage, distribution and miscellaneous service; also, a machine shop, boiler house, power substation and administration building. It will be used exclusively for the manufacture of fiber containers of type noted, and is reported to cost over $1,000,000, with machinery and equipment. Defense Plant Corporation, Washington, D. C., a Federal agency, will defray cost of plant and equipment, and will hold title to

property; American Can Company will operate the plant on a fixed-fee basis. It is proposed to ask bids on general erection contract at early date. The Banister Engineering Company, 1586 University avenue, St. Paul, is consulting engineer for project.

**Fort William, Ont.**—The Great Lakes Paper Company, Ltd., Fort William, manufacturer of newsprint, has plans maturing for proposed new addition to mill, previously noted in these columns, to be equipped for extensions in digester department and other divisions. Work is scheduled to be placed under way at early date. Cost reported over $85,000, including equipment.

**Asbestos, Que.**—The Canadian Johns-Manville Company, Ltd., Sun Life Building, Montreal, Que., Canadian subsidiary of Johns-Manville Corporation, 22 East 40th street, New York, N. Y., manufacturer of asbestos paper products, insulating board, wall board, will carry out expansion and improvement program at mill at Asbestos, in addition to construction of new one-story addition, 100 x 270 feet, recently referred to in these columns. Work will include other extensions for increased production and alterations in certain present structures. Entire project is reported to cost about $250,000, with machinery and equipment. Building noted will be equipped for shop and other production service. MacKinnon Corporation, Ltd., 7 Industrial street, Sherbrooke, Que., has the general erection contract.

### New Companies

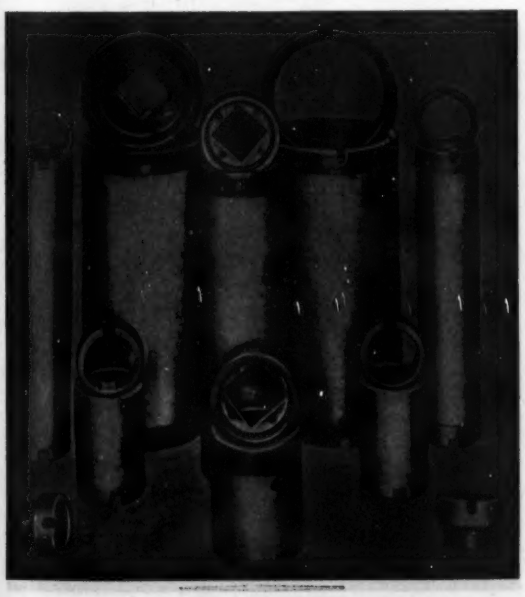
**New York, N. Y.**—The Northeast Paper Mills Corporation has been chartered with capital of 200 shares of preferred stock and 150 shares of common stock, to manufacture and deal in pulp and paper products. New company is represented by Robbins, Stationer, 25 Warren steet, New York, incorporating agent.

**New York, N. Y.**—The Bradshaw Company, Inc., has been organized with capital of $10,000, to deal in paper bags and containers, glassine paper bags, waxed paper stocks, etc. New company is represented by Rullo & Packard, 215 Montague street, Brooklyn.

**New York, N. Y.**—F. H. Knoll & Son, Inc., has been incorporated with nominal capital of $5000, to deal in paper products of various kinds. New Company is represented by James E. Clair, 605 West 132nd street, New York, attorneys.

**Brooklyn, N. Y.**—The Clermont Paper Stock Company, Inc., has been chartered with capital of 200 shares of stock, no par value, to deal in paper products of various kinds. New company is represented by Louis M. Liebert, 26 Court street, Brooklyn, attorney.

**Unionville, N. Y.** — Louis Ringel Pulp and Paper Mill Company, Inc., has been chartered with capital of 100 shares of stock, no par value, to operate a mill in this vicinity for the manufacture of wood pulp and paper specialties. It is understood that property will be taken over for new mill at early date. Company is represented by Manuel J. Price, 276 Fifth avenue, New York, attorney.

**ELIXMAN**

**CAPS** — Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all standard sizes.

Heavy duty caps with reenforced square hole. This patented feature of reenforcement gives added strength and durability.

**CORES**

Samples of caps or cores will be gladly submitted

**ELIXMAN PAPER CORE COMPANY, INC.**

CORINTH, N. Y.

## Extend Ban on Cellophane

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., February 16, 1942—The ban on use of cellophane and similar transparent materials derived from cellulose for certain packaging or manufacturing purposes has been extended to cover a long list of articles common to the American home. At the same time, an order issued by Donald M. Nelson, director of Priorities, cleared up major questions raised by the original ban and provided a solution for certain hardship cases.

The new order, issued as an amendment to Limitation Order L-20, is effective immediately and expires February 15. It does not apply to stocks of cellophane in users' hands on or before January 8, nor to stocks held by suppliers which were cut, processed or printed prior to January 8 in such a way that they could not be used by persons unaffected by the order. Defense orders, as defined, and use of off-grade, waste or defective cellophane also are exempt. Producers are required to make periodic reports on sales or deliveries of waste material.

Cellophane and similar transparent materials derived from cellulose are defined as having a thickness of less than five one-hundredths of an inch. Essential war chemicals, including chlorine, phenol and glycerine, are used to make these materials.

Twenty-four general uses of the materials, either for packaging or manufacturing, are prohibited. The original ban applied only to 10 general categories. Here are some of the things affected:

Razor blades and sets (except for export purposes); cosmetics and soaps; textiles, including such items as lingerie, sheets, pillow cases, towels, table linen, bedspreads, shirts, and hosiery, but not bandages, sanitary swabs and typewriter ribbons; rubber and rubber products, including bathing caps, garden hose, tires, and dress shields, but not where used in the backing of retreading stocks for tires or for wrapping rubber tape or nipples; hardware, metals and sporting goods, including tools, kitchenware, auto supplies, zippers, hairpins, pins and needles, fishing tackle, golf and tennis supplies, and silverware, but not where used to protect precision metal parts or for metals and metal parts for export;

Paper and paper products, including books, labels, tags, index cards, advertising and display material, carbon paper, facial tissues, greeting cards, playing cards, matchbook covers, school supplies, jig-saw puzzles, punch boards, picnic supplies, and stationery, but not including scotch tape or so-called window correspondence envelopes; fountain pens, pencils and leads; jewelry, clocks, watches and cameras; laundry and dry cleaning; candles and wax products; electrical equipment (except manufacture), including batteries and flashlights, washing machines, vacuum cleaners, refrigerators, toasters, heating pads, and radios;

Wood and wood products, including clothes pins, matches, wooden ware and dishes, forks and spoons, but not medical tongue depressers and swabs; leather and leather products, including shoes, belts and wrist bands; brushes and combs (except tooth brushes); bottled beverages, including alcoholic beverages, carbonated beverages and extracts, but not seals on bottles containing fluids which normally leak or evaporate; bottled foods, including sauces, salad dressings, fruit juices, pickles, olives, and preserves; canned goods of all sorts;

Flowers, florists' plants, wreaths and garlands, natural and artificial; decorations and novelties, including soda straws, gift wrapping, Easter grass, Easter egg dyes, cigarette tips, shelf edgings, and paper hats; cleaning material, including soap powder, polishes, metal sponges, mops, brooms, brushes, and shoe polish kits; cigar box and candy box overwraps, where used as a secondary wrap to protect the box or carton rather than the product; sewing supplies, coat hangers, dolls, cake decorations, toys and games, powder puffs, hair nets, paints, and molding clay and clay products, but not photographic films, cigarettes (except where tin foil has been eliminated either by an Office of Production Management order or at the option of the producers), and plastic products.

Suppliers are required to notify their regular customers of the terms of the order, but failure to give notice will not excuse any customer from compliance.

## To Make Wage Restitution

One paper products establishment in New York City and another in Buffalo, New York, will pay six employees a total of $143.30 in restitution of wages and overtime due under the Fair Labor Standards Act, Arthur J. White, regional director of the Wage and Hour Division, United States Department of Labor, announced today.

Upon payment of this sum and the agreement of the establishments to come into full compliance with the Fair Labor Standards Act the cases were closed.

The establishments are: Dica Waste Paper Company, 181 South Street, New York City; Alling & Cory, 136 N. Division street, Buffalo, N. Y.

## E. Butterworth & Co. Move

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., February 16, 1942—On or about March 1, E. Butterworth & Co., Inc., well known dealers in paper stock, will be located in their new and larger offices at 176 Federal street, as the Ordnance Department has taken over the quarters formerly occupied by the Butterworth company.

For nearly 80 years, E. Butterworth & Company, Inc., have maintained offices on Federal street. The company, now still operating after 103 years of successful business, invites the trade to call at the new offices.

## G. W. Pepper Resigns

G. Willing Pepper resigned as treasurer of Scott Paper Company, February 13 to enter the U. S. Navy. He has been commissioned as a lieutenant in the U. S. Naval Reserve and has reported for training.

Mr. Pepper, a former partner of Smith, Barney & Co., will continue as a director of the Scott Paper Company, but has been granted a leave.

William R. Scott 3rd, secretary will take over the office of treasurer.

## To Use Lime Sludge for Soil

Farmers will benefit by an accumulation of approximately 11,000 cubic yards of lime sludge at the Mosinee Paper Mills Company, Mosinee, Wis. A power shovel has been placed in the pit, and a fleet of trucks will haul the sludge for about four weeks, delivering it to farms to use for soil improvement.

# FINANCIAL NEWS

### New York Stock Exchange

High, Low and Last for Week Ending February 25, 1942

| | High | Low | Last |
|---|---|---|---|
| A. P. W. | 1⅜ | 1⅜ | 1⅜ |
| Armstrong Cork Co. | 24 | 23 | 23½ |
| Celotex Corp. | 7½ | 7¼ | 7¼ |
| Celotex Corp., pf. | 68 | 66 | 66 |
| Certain-Teed Products Corp. | 1⅞ | 1⅞ | 1⅞ |
| Certain-Teed Products Corp., pf. | 28 | 26½ | 28 |
| Champion Paper & Fibre Co. | 17 | 16¾ | 17 |
| Champion Paper & Fibre Co., pf. | 100 | 99 | 99¾ |
| Congoleum-Nairn Co. | 15⅝ | 15¼ | 15⅝ |
| Container Corp. of America | 12½ | 12 | 12⅜ |
| Continental-Diamond Fibre Co. | 8 | 8 | 8 |
| Crown-Zellerbach Co. | 11⅛ | 10⅝ | 10¾ |
| Crown-Zellerbach Co., pf. | 80⅞ | 80 | 80½ |
| Flintkote Co. | 10 | 9⅞ | 9⅞ |
| Robert Gair | 2 | 1⅞ | 2 |
| Robert Gair, pf. | 10⅛ | 9¾ | 9¾ |
| International Paper Co. | 14⅜ | 13½ | 14 |
| International Paper Co., pf. | 58¼ | 57½ | 58 |
| Johns-Manville Corp. | 60 | 58 | 60 |
| Johns-Manville Corp., pf. | 123 | 123 | 123 |
| Kimberly Clark Corp. | 28 | 27¾ | 27¾ |
| MacAndrews & Forbes | 20⅜ | 20¼ | 20¼ |
| MacAndrews & Forbes, pf. | .... | .... | .... |
| Masonite Corp. | 27⅜ | 26½ | 26½ |
| Mead Corp. | 6⅜ | 6⅛ | 6⅛ |
| Mead Corp., pf. | 72 | 72 | 72 |
| Paraffine Companies, Inc. | 25 | 25 | 25 |
| Paraffine Companies, Inc., pf. | .... | .... | .... |
| Rayonier, Inc. | 9¾ | 9½ | 9½ |
| Rayonier, Inc., pf. | 25 | 24½ | 25 |
| Ruberoid Co. | 16 | 16 | 16 |
| Scott Paper Co. | 32 | 32 | 32 |
| Scott Paper Co., pf. | 114½ | 114½ | 114½ |
| Sutherland Paper Co. | 18½ | 18¼ | 18½ |
| Union Bag & Paper Corp. | 8⅜ | 8¾ | 8¾ |
| United Paperboard Co. | 3⅞ | 3½ | 3⅞ |
| U. S. Gypsum Co. | 45¼ | 44¼ | 45¼ |
| U. S. Gypsum Co., pf. | 170½ | 170¼ | 170¼ |
| West Virginia Pulp & Paper Co. | 17 | 16 | 17 |

### New York Curb Exchange

High, Low and Last for Week Ending February 25, 1942

| | High | Low | Last |
|---|---|---|---|
| American Box Board Co. | .... | .... | .... |
| Brown Co., pf. | .... | .... | .... |
| Great Northern Paper Co. | .... | .... | .... |
| Hummel-Ross Fiber Corp. | 4¾ | 4¾ | 4¾ |
| National Container Corp. | 9 | 8¾ | 9 |
| St. Regis Paper Co. | 2½ | 2⅛ | 2⅛ |
| St. Regis Paper Co., pf. | 115½ | 115½ | 115½ |
| Taggart Corp. | 3¼ | 3 | 3 |

## Black-Clawson Earns $611,080

The Black-Clawson Company for the year to September 30, reports a net profit of $611,080 or $5.20 each on 112,420 common shares after preferred dividend requirements, compared with $107,035, or 72 cents each on 111,420 common shares in preceding fiscal year; net sales, $5,527,971, compared with $2,758,351.

## United Paperboard Reports Profit

The United Paperboard Company and subsidiaries reports for the six months to November 29 net profit of $192,561, equal, after preferred dividends, to 69 cents each on 240,000 common shares, compared with $24,875, or $2.79 a share on 8,900 shares of 6 per cent preferred stock, in six months ended Nov. 30, 1940.

## Hinde & Dauch Declared Dividend

The Hinde & Dauch Paper Company have voted a dividend of 25 cents a share on the common stock, payable on April 1 to stockholders of record March 7. Last year payments of 25 cents each on April 1 and July 1, and 50 cents each on October 1 and December 27 were made.

## Container Corp. Nets $2.98

The Container Corporation of America, maker of paperboard boxes, report for 1941 a net income of $2,427,177, or $2.98 a capital share, against a net income of $2,227,682, or $2.85 a share, in 1940. Sales were $46,714,221, against $30,464,677.

"It is estimated," Walter P. Paepcke, president, said, "that about 30% of our products is for defense. Among the specialized packages developed in connection with the war are containers for Army field rations for parachute troops and tank corps, for lease-lend shipments of powdered as well as frozen eggs, for various types of dehydrated foods, for small arms ammunition and many others; also such specialties as paperboard targets for machine-gun practice.

## American Writing Nets 86 Cents

The American Writing Paper Corporation reports twelve months' sales $8,713,133, compared with $6,334,993; net income $353,494 after taxes and charges, equal to 86 cents a share on 407,862 capital shares; year ago $26,214 and 6 cents a share. Cash $558,830, compared with $539,817; inventories $1,615,602, compared with $1,375,743; receivables $800,344, compared with $531,181; current liabilities $682,043, compared with $474,085.

## Gaylord Container Votes Dividend

The Gaylord Container Corporation declared an extra dividend of 12½ cents a share on the common stock in addition to the regular quarterly distribution of 12½ cents, both payable on March 16 to stockholders of record March 2. A similar payment was made on December 15, 1941.

## U. S. Envelope Nets $882,130

The United States Envelope Company reports net income for 1941 after $500,000 reserve for Federal income taxes, of $882,130, equal, after preferred dividends, to $22.94 each on 26,250 common shares, against 1940 net of $530,418 after $150,000 tax charges, equal to $9.54 a common share.

## Hummel-Ross Nets $1.44

The Hummel-Ross Fibre Company for 1941 reports a net profit of $604,145, equal, after preferred dividends, to $1.44 each on 391,706 common shares, excluding those held in treasury. This compares with $566,628, or $1.34 a common share the year before.

## Robert O'Neil Goes with OPA

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., February 23, 1942—Robert O'Neil, sales representative for Hollingsworth & Whitney Company in the New England territory, has taken a position with the OPA and is to be at the New England Regional office in this city.

PAPER TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger
EDITOR

Vol. 114 February 26, 1941 No. 9

## COMING EVENTS IN PAPER INDUSTRY

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

## TAXES AND INFLATION

The rise in consumer incomes has been rapid and has reached a record high mark under the extraordinary efforts exerted to mobolize all the resources of the country for war. Government purchasing of almost everything has been and continues very large and so has and continues consumer buying. The trend in retail sales moves higher. Factory payrolls, in January 1942, were 42% higher than in the like month last year. The average weekly factory wage last month was 21% higher than last year, with the hourly wage rate at a new record peak of 78 cents. Overtime payments account largely for these recent increases. To complete the picture, it is noted that farm income is up 30%, with wholesale farm prices 60% higher than two and one-half years ago; wholesale prices have increased 16% within a year; foods 37%.

With trade and industrial activity maintained at a very high level for many months, it is now about 20% higher than last year at this date. Priorities, huge government requirements and the temporary restriction and discontinuance of the manufacture of several varieties of civilian goods, has created a more serious threat of inflation.

To meet this impending rise in prices the most consistently advocated remedy has been higher taxes. Taxes and more taxes are the best possible economic defense of our people, Henry H. Heimann, executive manager of the National Association of Credit Men, declares in the association's monthly business review issued on February 15, and sent to its 20,000 manufacturing, wholesaling, and banking members. "Peacetime opposition to excessive spending and the attendant tax burden must give way to endorsement of higher and higher taxes", Mr. Heimann advises. "The value of conserving what we have out-weighs the importance of an immediate return on our investment. In favoring heavy war taxes, I am not advocating a socialistic or communistic doctrine of confiscation. Indeed, that is just what the program is intended to avoid. Simply put, it amounts to this: You are the owner of a savings account or an insurance policy for your family's protection or your old age; you quite likely have some property or shares of stock or bonds. These assets, the material aspects of our way of life, are in danger as are our social and political heritage."

Continuing, Mr. Heimann points out that, "You must act now in defense of your way of life and your life's accumulation. The greatest decision you can make is that for this and the remaining war years you are willing to be taxed to whatever possible limit of your ability to pay. You want no wasting of your money on 'frills', but you must be willing to concede that during these war years your job, and the nation's, will be to hold what you have. Such a decision will help protect your savings, even though it will not help pay all the war bill. Such a program at this particular time will go a long way to defend democracy and the capitalistic system of free enterprise. Let us tighten our belts and get ready for higher taxes. Let us now take the steps to preserve our way of life by an all-out anti-inflationary tax program. Such a program will not destroy our incentive. To claim that is to say we are dollar patriots".

Hand in hand with the military and naval campaigns, the United States must win both the battle of production and the battle against inflation. Declaring that although on the home front our production campaign improves daily, Mr. Heimann continues, "Our peace-time defenses against our ancient monetary and credit enemy, ruthless inflation, have been outflanked, infiltrated, weakened. We have a mongrel price control bill that is none too reassuring. Great gaps in our price control defense line are labor and agricultural costs. We have proposed legislation to permit direct buying of government securities by our Federal Reserve system. We do not question the motive of this bill, nor doubt the determination of its sponsors to keep control. Yet we cannot escape the fact that history has revealed the danger inherent in the direct monetization of government debt by the banking system. . . . We are all committed to every sound effort to win the war. Even some of the normal economic defenses may have to be replaced by, or adapted to meet new needs."

Analyzing today's credit situation, Mr. Heimann warns management against the widespread impression that this year will witness a seller's market, since war production will expand consumer purchasing power tremendously "Actually there is no one statement as simple as that which tells the entire story. True, enough, the total volume of consumer purchasing power, expressed in dollars, will rise. But in some areas, hard hit by war production dislocations, there

will definitely be lower incomes. Then too, the income tax burden this March will be assessed against a greater number of people than ever before in our history. . . . Add to this the vast increase in defense bond sales and the payroll-allotment plans for the sale of these certificates, and the possibility of deduction at source of income taxes in advance, and there is good reason for disagreeing with any such glib assertions that this year will witness a seller's market."

In concluding, Mr. Heimann explains that, "In many aspects there will be the appearance of a buyer's market. Some firms will be affected by this particularly, and credit policies should now be reconsidered with this in mind. There is increased reason for reserves during this period, for loss vulnerability is growing because of the emergency-stimulated needs for greater amortization, depreciation, obsolesence and maintenance charges, and eventual necessity for restoration of facilities to pre-war types of activity."

## Lake Sulphite Shares Off List

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., February 23, 1942—Common shares of Lake Sulphite Pulp Company, Ltd., were removed from the trading list on the Toronto Stock Exchange recently. The solicitor for the liquidator has advised that the court has sanctioned the sale of the assets of the company to Brompton Pulp and Paper Company, Ltd. The entire proceeds of the sale will go to satisfy claims of creditors.

## Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

| Current Weeks, 1942 | | Corresponding Weeks, 1941 | |
|---|---|---|---|
| January 10 | 102.7 | January 11 | 87.1 |
| January 17 | 103.9 | January 18 | 86.3 |
| January 24 | 104.1 | January 25 | 87.4 |
| January 31 | 103.2 | February 1 | 86.4 |
| February 7 | 104.1 | February 8 | 88.6 |
| February 14 (Preliminary) | *103.1* | February 15 | 89.3 |

COMPARATIVE MONTHLY SUMMARIES

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July |
|---|---|---|---|---|---|---|---|
| 1940 | 89.1 | 84.7 | 82.3 | 84.3 | 90.0 | 92.1 | 85.1 |
| 1941 | 85.6 | 89.7 | 92.2 | 96.0 | 98.7 | 99.3 | 94.2 |
| 1942 | *104.0* | ... | ... | ... | ... | ... | ... |

| Year | Aug. | Sept. | Oct. | Nov. | Dec. | Year Avg. |
|---|---|---|---|---|---|---|
| 1940 | 85.1 | 81.5 | 85.5 | 84.9 | 80.9 | 85.6 |
| 1941 | 101.0 | 99.7 | 105.2 | 106.0 | 100.7 | 97.3 |
| 1942 | ... | ... | ... | ... | ... | ... |

COMPARATIVE YEARLY SUMMARIES

| | 1935 | 1936 | 1937 | 1938 | 1939 | 1940 | 1941 | 1942 |
|---|---|---|---|---|---|---|---|---|
| Year to Date | 65.5 | 75.8 | 89.1 | 64.5 | 77.4 | 88.7 | 86.5 | 103.8 |
| Year Average | 69.9 | 80.4 | 79.8 | 71.5 | 83.4 | 85.6 | *97.3* | ... |

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS †

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1937 | 80 | 86 | 86 | 88 | 85 | 77 | 66 | 74 | 69 | 65 | 55 | 45 | 73 |
| 1938 | 54 | 60 | 61 | 57 | 58 | 56 | 57 | 66 | 66 | 70 | 65 | 59 | 61 |
| 1939 | 69 | 67 | 71 | 69 | 64 | 67 | 63 | 72 | 74 | 84 | 81 | 71 | 70 |
| 1940 | 71 | 70 | 69 | 70 | 76 | 79 | 72 | 74 | 72 | 79 | 77 | 71 | 73 |
| 1941 | 75 | 81 | 82 | 83 | 84 | 88 | 86 | 94 | 94 | 99 | 98 | 93 | 88 |
| 1942 | *102* | .. | .. | .. | .. | .. | . | .. | .. | .. | .. | .. | .. |

Week ending Jan. 10, 1942—101
Week ending Jan. 17, 1942—102
Week ending Jan. 24, 1942—101
Week ending Jan. 31, 1942—101
Week ending Feb. 7, 1942—101
Week ending Feb. 14, 1942—*101*

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

# Flotation Treatment of White Water*

By E. N. Poor[1] and H. A. Whitenight[2]

**Abstract**

*The paper deals with the use of pure fatty acid and natural fat soaps in the flotation of white waters containing both clay and clay-fiber mixtures. With the pure fatty acid soaps, the efficiency of flotation increased with the length of the acid, carbon chain, from 6 to 14 inclusive—above this, a decrease was noted. An increase in the proportions of fiber present in the suspension produced consistent improvement in flotation. Efficiency increased with the alum concentration up to an optimum point and then decreased. The efficacy of natural fat soaps tended to increase with the extent of unsaturation. Such mixtures of fatty acids were found to be decidedly inferior to the constituent acids when used individually.*

The application of flotation methods for the separation and recovery of the materials from white water continues to enlarge in scope. As a result of research the efficiency and versatility of such methods have been materially enhanced by the development of new types of chemical treatment. While many of the materials used at the present time are satisfactory under specific water conditions, the knowledge of the optimum treatment, for any given type of water, is extremely limited. This is clearly indicated by the fact that most investigators have considered waters containing fiber only or in conjunction with small amounts of inert fillers. While it is conceded that such waters are typical of most paper plants, the results obtained are of little value in predicting the necessary changes to permit maintenance of operating efficiency under all conditions, typical or otherwise. A concrete example of this is the fact that some agents will not flocculate clay only; whereas others exhibit only slight differences with clay and clay-fiber mixtures.

Since most white waters contain varying amounts of aluminum ion, a familiar class of compounds, fatty acid soaps, has been utilized to a limited extent in flotation processes. Because these form insoluble compounds, which promote flocculation and occlude air readily, they are particularly adaptable to a flotation process.

This investigation was undertaken (1) to determine the relative efficiencies of various soaps of natural fats and pure fatty acids, for practical application; (2) to establish the effects of soap properties; (3) to evaluate the effect of fiber-filler ratios, and (4) to establish the influence of alum concentration.

## Description of Apparatus

The apparatus (Fig. 1) was designed to duplicate the conditions of treatment in a commercial save-all *(4)*. Essentially it consisted of a flotation chamber with an aeration tube coupled to a vessel for the simultaneous addition of the flocculating reagents; a light source transmitting a beam through the flotation chamber; a photoelectric cell for measuring the intensity of transmitted light; and a mercury levelling device for the application of vacuum.

Aeration was accomplished by water displacement of a constant volume of air in a reservoir, the air passing into the flotation chamber through a perforated glass sphere at the end of the aerating tube. Both the source of light and the phototube were supplied with current from a voltage regulator, equipped with variable resistors for necessary adjustments.

## Procedure

The clay and fiber used in the investigation were allowed to remain in water for 24 hours before use. The water temperature was 25 ±2 deg. C. The soap solutions were freshly prepared from the glycerin-free anhydrous soaps before use.

The suspended solids and alum were added to the flotation chamber. The soap solutions, in constant volume and a concentration not exceeding 0.02%

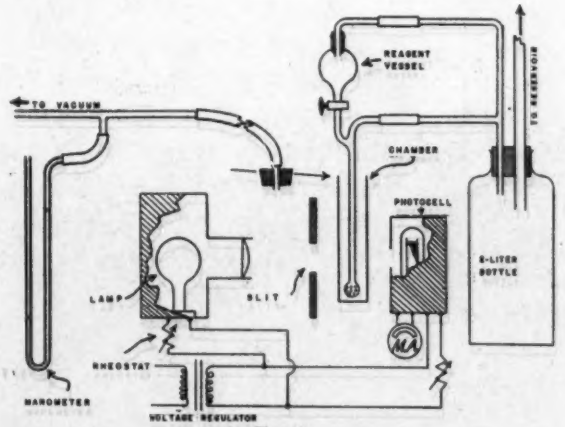


FIG. 1
Flotation Apparatus

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 16-19, 1942.

[1] Member TAPPI; Technical Director, W. C. Hamilton & Sons, Miquon, Pa.

[2] Chemist, Reilly-Whiteman-Walton, Conshohocken, Pa.

were contained in a vessel attached to the aerating tube. During displacement of air in the air reservoir, the soap was allowed to enter the flotation chamber. After aeration was complete, the aerating tube was removed and vacuum, equivalent to 7 inches of mercury, immediately applied. From this time the milliammeter readings were recorded at 30-second intervals.

### (A) Efficiency of Pure Fatty Acid Soaps

Figures 2 and 3 indicate the relative efficiencies of six fatty acid soaps in the flotation of 200 p.p.m. of clay, using 250 p.p.m. of alum and soap concentrations of 10 and 30 p.p.m., respectively, based on the fatty-acid content. All soaps are of the saturated type, with the exception of oleic, which contains one double bond of unsaturation. It is noted that the efficiencies increase with the length of the acid chain up to and including myristic with 14 carbon atoms, and then decrease with greater chain length. Oleic, with 18 carbon atoms, is relatively ineffective, being approximately equivalent to capric and decidedly inferior to the saturated acid of the same length—i.e., stearic. The clarity of pure water is 4.5 ma.

Figure 4 relates to the flotation of 600 p.p.m. of solids, consisting of clay and fiber in equal proportions, using 250 p.p.m. of alum, 30 p.p.m. of soap. The same relationship is evident, myristic being superior to all soaps investigated. In this case, however, oleic is more effective than both capric and stearic. Two new fatty acids, caproic and caprylic, of 6 and 8 carbon atoms, respectively, are included and the results are in agreement with the relationship established above.

In a few cases, notably with oleic acid, the initial flotation is most rapid, but reaches a maximum considerably below that of other acids showing a lower rate at the beginning. This is somewhat contrary to past observations that the initial rate of flotation induced by a chemical agent is indicative of its efficiency *(5)*. The varying behavior of oleic acid confirms the above statement that the efficacy of a flotation agent, insofar as it is affected by characteristics of the white water solids, cannot be predicted.

The explanation of the superiority of an intermediate chain length acid, specifically, myristic, is extended as follows: The insolubility of the aluminum soaps formed from the fatty acids, increases with the length of the carbon chain. A large portion

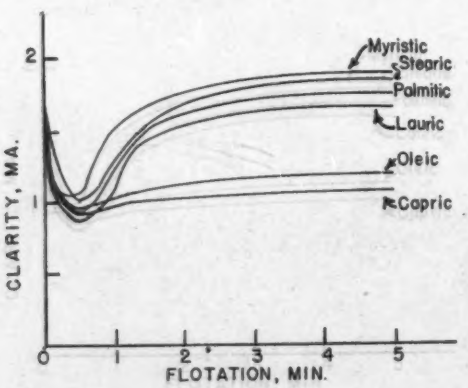


FIG. 2
Flotation of Clay. Clay: 200 p.p.m.—Alum: 250 p.p.m.—Soaps: 10 p.p.m.

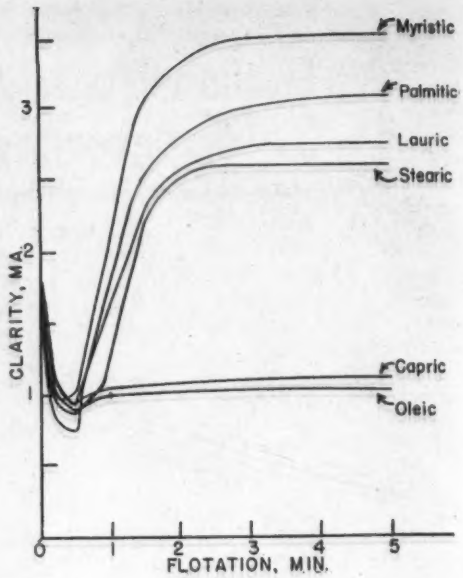


FIG. 3
Flotation of Clay. Clay: 200 p.p.m.—Alum: 250 p.p.m.—Soaps: 30 p.p.m.

of the aluminum soap from short-chain length acids is relatively ineffective because of solubility; whereas, the longer chain soaps are so insoluble, that they form as a hard precipitate before any solid particles are enveloped. As a result, a substantial portion of these soaps is not utilized in the flotation process. Apparently the optimum aluminum soap insolubility exists at a chain length of 14 carbon atoms.

### (B) Effect of Fiber-Filler Ratio

Figure 5 indicates the relative effects of varying fiber-filler ratios at constant solids content. The investigation was made with stearic acid at 30 p.p.m.

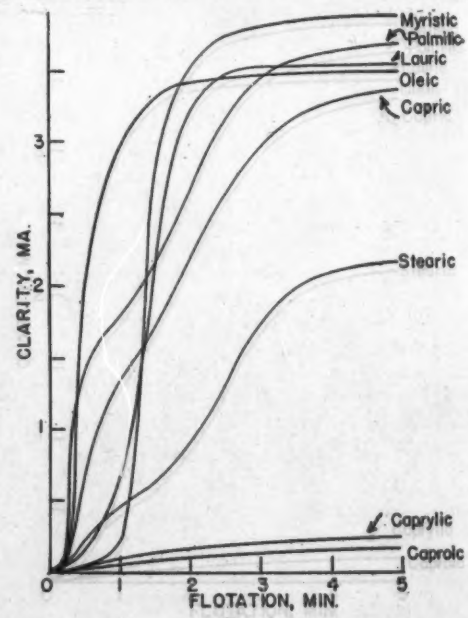


FIG. 4
Clay-Fiber Flotation. Clay-Fiber: 1:1—Total Solids: 600 p.p.m.—Alum: 250 p.p.m.—Soaps: 30 p.p.m.

with 250 p.p.m. of alum. This soap, being comparatively ineffective in the flotation of clay only, and 100% with fiber, is particularly adaptable to establishing the effect of such ratios. It is evident that efficiency increases enormously with the proportions of fiber present in the suspension. With other acids, however—e.g., myristic, which is considerably more effective with clay only—the improvement due to the introduction of fiber, is of a smaller magnitude.

### (C) Effect of Alum Concentration

While the effect of alum in the flotation of materials has been investigated to a large extent, most of the work has concerned chemical agents which do not actually form aluminum compounds. Soaps do form such compounds. Figure 6 shows the effect of alum concentration in the flotation of 200 p.p.m. of clay, using 20 p.p.m. of myristic acid soap. Increasing amounts of alum produce more effective flotation up to an optimum concentration—above this the efficiency is impaired which apparently depends on the varying solubility of the aluminum soap formed at various alum concentrations. With low alum, according to the law of mass action, a large portion of the aluminum soap is in solution and, therefore, ineffective in flotation. With larger amounts of alum, the precipitation of soap is so rapid, that a considerable portion forms before occlusion of any suspended particles and the effective flotation is decreased. We would call attention to the initial increase in water opacity, as evinced by lower milliammeter readings. This was found to be the result of the rate of soap precipitation only, independent of suspended particles (Fig. 7).

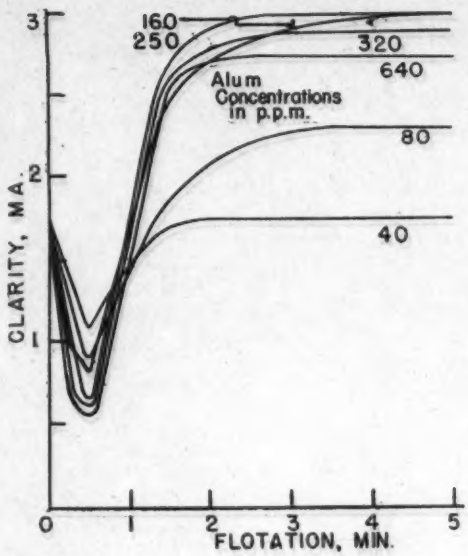


FIG. 6

Effect of Alum Concentration on Flotation of Clay. Clay: 200 p.p.m. —Myristic Acid Soap: 20 p.p.m.

### (D) Comparison of Soaps of Natural Fats

Figures 8 and 9 show comparisons of the behavior of soaps of the more common natural fats in the flotation of suspended solids containing equal proportions of fiber and clay. In general, the soaps of these fats contain acids of 18-carbon atom molecules, saturated and unsaturated, with the exception of coconut, so that comparisons from the standpoint of chain length are not significant. With such soaps, the indications are that the efficiency tends to increase with the extent of unsaturation, usually designated by the iodine number, but, many inconsistencies were noted.

The results obtained with palm oil were unexpectedly low, in view of those exhibited by the soaps of the main constituent acids. In order to explain this, mixtures of oleic and palmitic, in the ratio existing

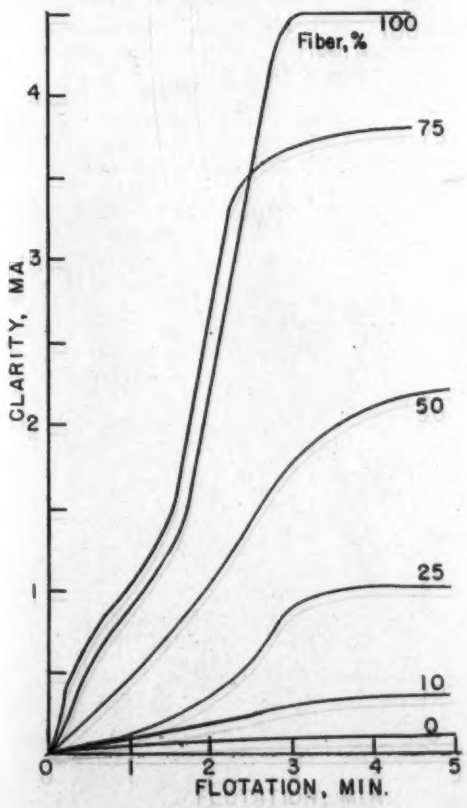


FIG. 5

Effect of Filler-Fiber Ratio. Total Solids: 600 p.p.m.—Alum: 250 p.p.m.—Stearic Acid: 30 p.p.m.

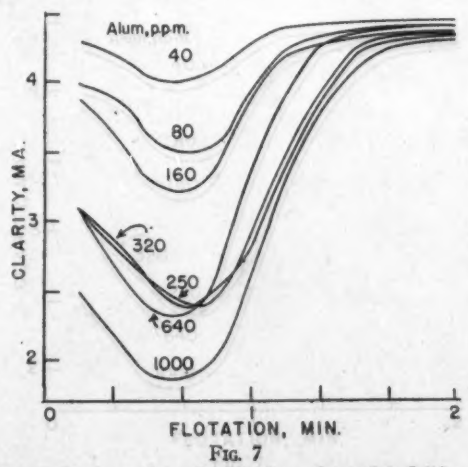


FIG. 7

Effect of Alum on Soap Precipitation. Suspended Solids: 0.—Myristic Acid Soap: 20 p.p.m.

for palm oil, were investigated and found to be far inferior to the results obtained with each acid individually. In fact, they were substantially equivalent to the oil itself. Coconut oil, as in the case of palm, exhibits the fact that mixtures of fatty acid soaps are inferior to the individual soaps. Castor oil, containing 84% ricinoleic acid, indicates that hydroxylated fatty acids are extremely efficient. The action of wood rosin signifies that cyclic unsaturated acids are relatively ineffective.

TABLE II.—COMPARISON OF TALL OIL AND ROSIN

| | Tall Oil | Wood Rosin |
|---|---|---|
| Rosin Acids | 44 | 90 |
| Oleic Acid | 8 | .. |
| Linoleic Acid | 39 | .. |
| Linolenic Acid | 3 | .. |
| Unsaponifiable | 6 | 10 |

## Conclusions

In soap flotation, the insolubility of aluminum soap is the most important factor in efficiency. The effectiveness of pure saturated fatty acid soaps increases with the length of the carbon chain up to and including 14, above this the efficiency is impaired. Increasing proportions of fiber in the suspension augment the action of the fatty acid soaps, and the extent of improvement varies with the type of soap present. Flotation efficiency increases with alum concentration up to an optimum point and then decreases. In general, the effectiveness of natural fat soaps tends to increase with the extent of unsaturation. The behavior of such soaps cannot be predicted by that of the individual fatty acid constituents.

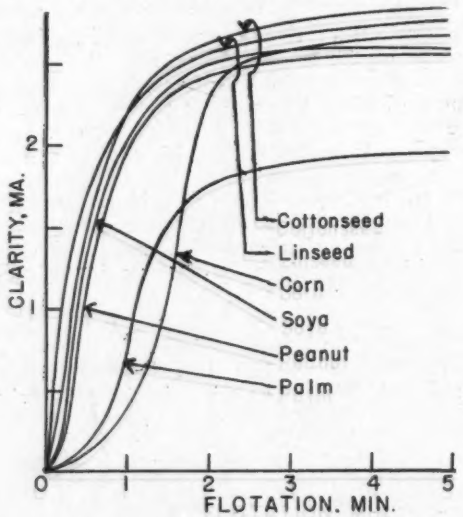


FIG. 8

**Flotation with Natural Fat Soaps. Clay-Fiber: 1:1—Total Solids: 600 p.p.m.—Alum: 250 p.p.m. Soaps: 30 p.p.m.**

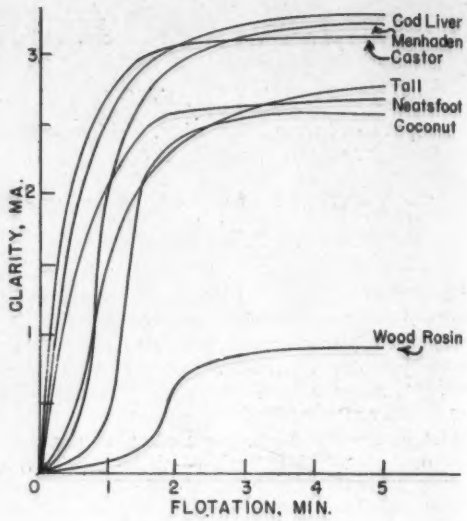


FIG. 9

**Flotation with Other Natural Fat Soaps. Clay-Fiber: 1:1—Total Solids: 600 p.p.m.—Alum: 250 p.p.m. Soaps: 30 p.p.m.**

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## Wood Technology

Under the title of "Wood Technology", H. D. Tiemann, M.E., M.F., has written a book providing authoritative information on the constitution. properties and uses of wood. The book is published by the Pitman Publishing Corporation, 2 West 45th street, New York, at $3.50 a copy.

The author is senior wood physicist with the U. S. Forest Products Laboratory, and lecturer in forest products at the University of Wisconsin.

Although this book is most useful for those interested in the use or processing of wood, it contains interesting data on the structure of wood, how to identify various species, the structure of the cell wall and chemical utilization of cellulosic fibers and synthetic substitutes.

TABLE I.—TYPICAL ANALYSES OF NATURAL FATS INVESTIGATED

| Fatty Acids | Chain Length (carbon atoms) | Unsaturation (double bonds) | Coconut | Palm | Neatsfoot | Cottonseed | Peanut | Corn | Soya Bean | Linseed | Menhaden | Cod Liver | Castor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Caproic | 6 | saturated | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Caprylic | 8 | | 7.8 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Capric | 10 | | 7.6 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Lauric | 12 | | 44.8 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Myristic | 14 | | 18.1 | 1.5 | ... | ... | ... | ... | ... | ... | 6.0 | 6.0 | ... |
| Palmitic | 16 | | 9.5 | 42.9 | 18.0 | 21.9 | 8.5 | 7.8 | 6.5 | 10.3 | 16.0 | 8.5 | ... |
| Stearic | 18 | | 2.4 | 4.7 | 3.0 | 1.9 | 6.0 | 3.5 | 4.2 | ... | 1.5 | 0.5 | 3.0 |
| Arachidic | 20 | | ... | ... | ... | ... | 4.9 | 0.4 | 0.7 | ... | ... | ... | ... |
| Lignoceric | 24 | | ... | ... | ... | ... | 3.0 | 0.2 | 0.1 | ... | ... | ... | ... |
| Palmitoleic | 16 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 15.5 | 20.0 | ... |
| Oleic | 18 | 1 | 8.2 | 39.8 | 79.0 | 30.7 | 51.6 | 46.3 | 32.0 | 9.1 | ... | ... | 10.0 |
| Linoleic | 18 | 2 | 1.5 | 11.1 | ... | 44.9 | 26.0 | 41.8 | 49.3 | 36.4 | 30.0 | ... | 3.0 |
| Linolenic | 18 | 3 | ... | ... | ... | ... | ... | ... | 2.2 | 44.2 | ... | ... | ... |
| Ricinoleic | 18 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 84.0 |
| Misc. Unsaturated Acids | .. | .. | ... | ... | ... | ... | ... | ... | ... | ... | 31.0 | 65.0 | ... |
| Iodine Value[1] | .. | .. | 8.2 | 52.0 | 73.6 | 106.0 | 95.4 | 119.0 | 131.0 | 179.0 | 166.0 | 158.0 | 84.3 |

[1] Determinations made on oils actually used in preparation of soaps.

# Causticizing, Reburning, and Settling in Sulphate Lime Recovery*

By George B. Hughey,[1] L. Kermit Herndon[2] and James R. Withrow[3]


## Abstract

*The influence of the sodium sulphide in green liquors from the sulphate pulping process on the equilibrium causticizing efficiency in the recausticizing process was that of lowering the efficiency slightly more than an equivalent quantity of sodium hydroxide. The empirical mathematical expression relating the causticizing efficiency* E, *the total titratable alkali* S,*($Na_2CO_3$ + NaOH + $Na_2S$), the $Na_2S$,* F, *and the $Na_2SO_4$,* A(S, F, *and* A *all expressed as grams per liter of $Na_2O$) was found in our cases to be:*

$$E = 100 - 0.003\ S - 0.00077\ S^2 - 0.04\ F - 0.1\ A.$$

*The variations in the initial settling rate of typical sulphate lime sludges, caused by changes in temperature, solid to liquid ratio, and washing have been satisfactorily correlated by a simplified modification of the McCabe-Egolf factor. A straight-line relationship was obtained by making a log-log plot of the initial settling rate* versus *the factor* $\frac{\rho^1 - \rho}{Z} \cdot H_o/H_u$ [*the difference in density between the settling solid ($\rho^1$) and the clear liquid ($\rho$), divided by the viscosity of the clear liquid (Z), and multiplied by the ratio of the original slurry height ($H_o$) to the final sludge height ($H_u$)*].

*The effect of the recovery cycle on the availability of the reburned lime, when "new lime" of 78.7% availability was added to raise the availability to 73.8%, was that a constant level of 70% availability was reached after the first cycle. The settling rate of the sludge approached a level after two or three cycles, 15 to 20% higher than that of the "new lime" sludge under the specific conditions of these tests.*

*Portions of a sample of dried sulphate lime "mud" (about 98% $CaCO_3$) obtained from a sulphate mill to which NaOH was added in amounts from 0.1% to 12%, as $Na_2O$, then calcined for 2 hours at 1100 deg. C., gave a range of causticizing availabilities from 85 to 50%, respectively.*


## Introduction

The conversion of sodium carbonate to sodium hydroxide by causticizing sulphate green liquor with lime is one of the vital chemical recovery steps in the sulphate pulping process. The fundamental considerations in this causticizing do not differ greatly from those encountered in the normal production of caustic soda from soda ash and lime. The degree of completion of the reversible reaction.

$$Na_2CO_3 + Ca(OH)_2 \leftrightarrows 2\ NaOH + CaCO_3$$

and the settling rate of the resulting calcium carbonate sludge are the general considerations in either case. The numerous other factors that influence these two considerations have been outlined by Dorr and Bull *(1)*.

Considerable information dealing with the causticizing of pure sodium carbonate solutions has been published, but the influences of the other constituents of commercial sulphate green liquors, such as sodium sulphide, sodium sulphate and sodium hydroxide, have not been thoroughly reported. Also, apparently no laboratory data have been published on the reburning of this specific calcium carbonate sludge and the behavior of the resulting reclaimed lime on recausticization. In addition, it appears that no information has been published on the possible correlation of effects of temperature changes, solid to liquid ratio changes, and washing with the settling-rate of the lime sludge.

### Objectives

This research had three objectives: (a) to investigate the influence of sodium sulphide and other constituents present in commercial sulphate green liquors on the causticizing reaction; (b) to furnish some laboratory data on the reburning of typical sulphate lime mud, such as the effect of time and temperature of burning, cycling through the process, and the alkali content of the mud, on the quality of the reclaimed lime; (c) to attempt a correlation of the settling rate of the sulphate lime sludges with the physical properties of the white liquor and the dry mud, involving variations in solid to liquid ratio, temperature, and washing.

### Green Liquors Used

The commercial green liquors used in the experimental work were furnished by three southern sulphate paper mills. Table I gives the sources and chemical analyses of these green liquors.

The quicklimes used were selected to give a wide range in chemical composition. The information as

TABLE I.—SOURCES AND ANALYSES OF SULPHATE GREEN LIQUORS USED

| Number | 1 | 2 | 3 |
|---|---|---|---|
| Source | Brunswick Pulp and Paper Co., Brunswick, Ga. | Southern Kraft Corp., Moss Point, Miss. | Union Bag & Paper Corp., Savannah, Ga. |
| Chemical Analysis | grams/liter | grams/liter | grams/liter |
| $Na_2CO_3$ | 145.2 | 130.3 | 158.0 |
| as $Na_2O$ | 85.0 | 76.3 | 92.5 |
| $Na_2S$ | 39.0 | 42.1 | 27.3 |
| as $Na_2O$ | 31.0 | 33.5 | 21.7 |
| NaOH | 15.6 | 23.2 | 24.4 |
| as $Na_2O$ | 12.1 | 18.0 | 18.9 |
| $Na_2SiO_3$ | 2.8 | 1.6 | 2.0 |
| as $Na_2O$ | 1.4 | 0.8 | 1.0 |
| $Na_2SO_4$ | 2.5 | 24.4* | 2.1 |
| as $Na_2O$ | 1.1 | 10.7 | 0.9 |
| $Na_2SO_3$ | 4.4 | 3.8 | 1.4 |
| as $Na_2O$ | 2.2 | 1.9 | 0.7 |
| Total Active Alkali as $Na_2O$ | 128.1 | 127.8 | 133.1 |
| Grand Total Alkali as $Na_2O$ | 132.8 | 135.2 | 135.7 |

* It was noted that this $Na_2SO_4$ content was high as received by us and must be presumed to be the result of the conditions under which this mill operates.

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 16-19, 1942.

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[2] Assistant Professor Chemical Engineering, The Ohio State University, Columbus, Ohio.
[3] Professor Chemical Engineering, The Ohio State University, Columbus, Ohio.

TABLE II.—QUICKLIMES EMPLOYED IN EXPERIMENTAL WORK

| Number | 1 | 2 | 3 |
|---|---|---|---|
| Type | Lump | Pebble | Lump |
| Chemical Analysis | % | % | % |
| Loss on Ignition | 0.80 | 0.56 | 0.90 |
| $SiO_2$ + Insolubles | 1.20 | 3.50 | 0.10 |
| $Al_2O_3$ + $Fe_2O_3$ | 0.40 | 0.80 | 0.10 |
| CaO | 96.1 | 86.8 | 64.0 |
| MgO | 0.86 | 8.30 | 36.4 |
| Available Lime | 90.2 | 78.7 | 54.5 |

to the types and analyses are given in Table II.

Lunge *(2)*, in his causticizing experiments, carried out the reaction in closed copper tubes agitated by pebbles on rotation. Harrop and Forest *(3)*, in their work on causticizing soda ash solutions, used a large glass beaker equipped with an agitator and with a closed steam coil for heating, and made settling rate determinations directly in the beaker. Goodwin *(4)* and Goodwin and Sills *(5)* used covered 250-cc. nickel crucibles, equipped with agitators but they did not concern themselves with the settling rate of the sludges. Olsen and Direnga *(6)* adopted Goodwin's apparatus and determined the settling rate of the sludge by transferring the causticized slurry to a 100-cc. graduated cylinder which they kept in a constant-temperature bath.

### Apparatus

The apparatus built for this investigation for carrying out the causticizing reaction and settling-rate tests was patterned after the one used by Dorr and Bull *(1)*, with modifications so that two determinations could be carried out at one time. It consisted of a wooden cabinet equipped with a detachable glass front and individual rheostatically-controlled heaters for the two 3000-cc. beakers and the air. The stirring during causticizing was performed by propeller agitators, belt-driven from a single motor attached to the back of the cabinet. These agitators were hollow and so constructed that they could be withdrawn quickly from the slurry at the start of the settling-rate determination. An electric fan was located directly above the air heaters for the purpose of obtaining a uniform air temperature. The beakers were equipped with covers in which calibrated thermometers were inserted into the slurry. The slurry level and sludge line level were measured to within 0.5 mm. by adjustable steel rods that extended through the beaker covers into the beakers. These measuring rods had knife edges attached to their upper ends which contacted vertical meter sticks.

## Procedure for Causticizing and Settling-Rate Tests

### Causticizing and Settling

The procedure was selected to give consistent results and was not necessarily the one that would give the fastest settling sludge. Unless otherwise specified, the procedure followed in the causticizing was: 1000 cc. of the liquor to be causticized was placed in each of the two 3-liter Pyrex glass beakers and the temperature of the liquor elevated to 90 deg. C. over a gas burner. The quicklime, which had been previously sized (4.7 to 2.4 mm. diameter, through no. 4 mesh and on no. 8 mesh), proportioned and stored in individual airtight glass jars, was then carefully poured into the beakers simultaneously.

The quicklime, upon contact with the 90 deg. C. green liquor started slaking almost at once and elevated the temperature to near the boiling point, or about 103 deg. C. in 2 or 3 minutes. The agitator was not used during the slaking operation because the vigorous reaction was sufficient. The water vaporized during the preheating and slaking was determined by weighing the beaker and liquor before heating and then after the slurry had subsided, making due allowance for the added lime, and then the water loss replaced.

After this preheating and slaking, which took about 15 minutes, the two beakers were placed in the causticizing cabinet which had already been brought to the temperature of 95 deg. C. The original slurry levels were recorded, the agitators inserted and rotated at 250 r.p.m. in the slurry for 60 minutes during which time the cabinet and contents were maintained at 95 ± 2 deg. C. After compensating for evaporation by adjusting the slurry height to the initial value by adding hot water (usually about 10 cc.) and stirring a few more minutes, the agitators were withdrawn simultaneously and a stop watch started. The height of the sharply defined sludge line was recorded each minute by quickly adjusting the indicator rods as the minutes passed. During the settling tests the temperature of the air in the cabinet was held at the same temperature as the slurry, thus preventing convection disturbances and temperature change.

Ten minutes after the settling test was started, a 10-cc. sample of the clear supernatant liquor was pipetted from each beaker and drained into small sample bottles and tightly stoppered. These liquor samples, after cooling to room temperature, were analyzed for $Na_2CO_3$, NaOH, and $Na_2S$.

After obtaining liquor samples, the agitation was resumed (250 r.p.m.) for 60 minutes at 95 deg. C. and the procedure repeated. After taking the second set of liquor samples the sludge level was observed until no further settling was evident. This level was recorded as the final sludge *height* and the volume at this height as the final sludge *volume*.

The height of the sludge line was plotted against time, and in almost every case a straight line resulted that changed rather sharply to become constant at the final sludge height. The rate of fall of the sludge line during the constant rate period or straight-line period was taken as the initial settling rate of the sludge.

### Washing of the Lime Mud after Causticization

The clear hot white liquor was decanted into a labeled sample bottle, stoppered, and stored for reference. Next the thick sludge or mud was filtered on a large Buchner suction funnel until only about 1 drop of filtrate left the funnel per minute. After this primary filtration the filter cake was repulped to exactly 2600 cc. volume, stirred and allowed to settle. Then 2000 cc. of the clear supernatant liquor was decanted and the procedure repeated until a 50-cc. aliquot of the decanted liquor required about 1.5 to 2.0 cc. of 0.1 *N* HCl to reach the methyl orange end point. This assured an alkali content in the dried mud of about 0.1% $Na_2O$. The mud was then filtered, dried at 105 deg. C., weighed and stored in airtight glass containers.

### Analysis of Liquors for $Na_2CO_3$, NaOH, and $Na_2S$

The procedure adopted for the determinations of the various alkalies was that given in the TAPPI textbook *(7)*. Five cubic centimeters of the liquor was pipetted into a 250-cc. volumetric flask

and the flask filled to the mark with distilled water. After thorough mixing, 50 cc. of this diluted liquor was titrated with 0.1 *N* HCl to the phenolphthalein end point *A*; and then on to the methyl orange end point *B*. Another 5 cc. of the liquor was pipetted into a 250-cc. volumetric flask containing 25 cc. of 20% $BaCl_2$ solution, mixed thoroughly, and diluted to the mark. After allowing the barium carbonate precipitate to settle, a 50-cc. aliquot was titrated with 0.1 *N* HCl to the methyl orange end point *C*. Then by subtracting *C* from *B*, the value for the $Na_2CO_3$ was obtained. Also, $2(B-A) - (B-C)$ gave the cubic centimeters of standard acid equivalent to $Na_2S$, while, $B - 2(B-A)$ gave the cubic centimeters of standard acid equivalent to the NaOH in the liquor. These were readily calculated to grams per liter of $Na_2O$.

### Analysis of Quicklimes and Calcium Carbonate Muds

The procedures for the determination of the loss on ignition, silica and insoluble matter, iron oxide and alumina, calcium oxide, and magnesia were adopted from the official TAPPI Standards *(8)*.

The availability of the quicklimes was determined by measuring the amount of NaOH produced by a known weight reacting with a large excess of $Na_2CO_3$ solution. The method consisted of refluxing the lime with the carbonate solution for 3 hours and then titrating the NaOH after the excess sodium carbonate was treated with $BaCl_2$.

The water-soluble alkali in the mud and reburned lime samples was determined by digesting for several hours with a large excess of ammonium carbonate solution, evaporating to dryness, taking up with hot water and washing the free alkali out and finally titrating the washings with standard acid to the methyl orange end point.

## Effect of Initial Alkalies on Equilibrium Causticizing Efficiency

A summary of the present experimental data as well as a comparison with previous investigations of the effect of the initial concentration of alkalies on the equilibrium causticity is shown in Fig. 1. In order to permit comparison, the results of Lunge *(2)*, and Goodwin *(4)*, and Goodwin and Sills *(5)* were recalculated from weight percentage of $Na_2CO_3$ to grams per liter of $Na_2O$. It was quite obvious from these results that Goodwin was confirmed in his conclusion that Lunge's results were too high. Olsen and Direnga *(6)* in a more recent paper arrived at the same conclusion. The present experimental data also confirm the unusual depression of the causticizing efficiency by sodium sulphide as reported by Goodwin and Sills. [In working with C.P. $Na_2CO_3$ liquors, the term "causticity" is equal to: 100 NaOH/(NaOH + $Na_2CO_3$) all expressed in grams per liter of $Na_2O$. Since there is no initial NaOH present in C.P. $Na_2CO_3$ solutions, this expression becomes equal to the percentage "conversion" of $Na_2CO_3$ to NaOH. However, when speaking of sulphate green liquors, where both NaOH and $Na_2S$ are present, the above expression is called "causticizing efficiency." *See* TAPPI Standards *(8)*.]

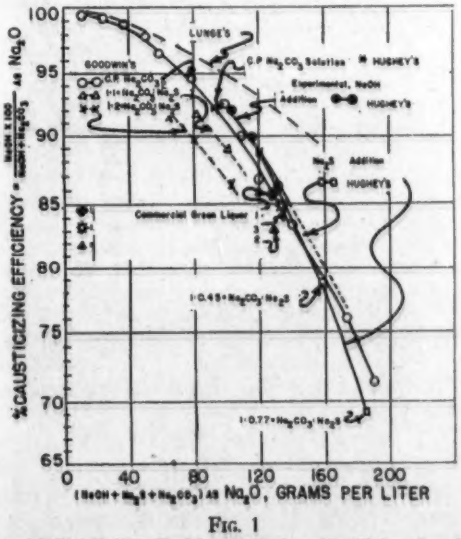


FIG. 1
Effect of Initial NaOH, $Na_2CO_3$ and $Na_2S$ on Equilibrium Causticizing Efficiency

## Effect of Sodium Sulphate on Equilibrium Causticizing Efficiency

By following the equilibrium causticizing efficiency as additions of C.P. $Na_2SO_4$ were made to batches of Green Liquor 3, it was found that for each gram per liter, as $Na_2O$, of sodium sulphate added the causticizing efficiency was depressed 0.1%. This observation explains why the equilibrium causticizing efficiency for Green Liquor 2 fell slightly below the curves of Fig. 1. Green Liquor 2 contained 10.7 grams per liter, as $Na_2O$, of $Na_2SO_4$ as compared with 1.1 and 0.9 grams per liter of Green Liquors 1 and 3, respectively.

## Empirical Equation Relating Green Liquor Composition with the Equilibrium Causticizing Efficiency

The following mathematical expression was derived from the experimental data on causticizing the sulphate pulp mill and the synthetic sulphate green liquors with excess lime:

$$E = 100 - 0.003\,S - 0.00077\,S^2 - 0.04\,F - 0.1\,A$$

where E = equilibrium causticizing efficiency, %

$$= \frac{NaOH + Na_2CO_3}{NaOH} \times 100,$$ (all expressed as grams per liter of $Na_2O$)

S = ($Na_2CO_3$ + NaOH + $Na_2S$) in the green liquor in grams per liter of $Na_2O$.

F = $Na_2S$ in the green liquor as grams per liter $Na_2O$.

A = $Na_2SO_4$ in the green liquor as grams per liter of $Na_2O$.

The accuracy of this empirical equation is shown in Table III.

TABLE III.—CALCULATED AND EXPERIMENTAL EQUILIBRIUM CAUSTICIZING EFFICIENCIES

| Green Liquor | % Causticizing Efficiency | |
|---|---|---|
| | Calculated | Experimental |
| 1 | 85.6 | 85.7 |
| 2 | 84.6 | 83.5 |
| 3 | 84.8 | 84.8 |

## Calcining Lime Sludge from the Sulphate Process

Ray and Mathers *(11)* studied the effect of the variables of time and temperature of burning high calcium limestones on settling rates. Linzell, Holmes, and Withrow *(12)* have presented data on limestone burning which indicated that the rate of calcination depended upon the chemical composition, porosity of the stone and the furnace atmosphere. Berger *(13)* presented data showing that calcining limestone in the presence of steam increased the calcining rate

TABLE IV.—SOURCES AND ANALYSES OF COMMERCIAL SULPHATE LIME SLUDGES USED

| Number | 1 | 2 |
|---|---|---|
| Source | Brunswick Pulp and Paper Co. Brunswick, Ga. | Southern Kraft Corporation Moss Point, Miss. |
| Chemical Analysis | % | % |
| Ignition Loss | 43.9 | 40.8 |
| $SiO_2$ + Insolubles | 0.1 | 0.5 |
| $Al_2O_3$ + $Fe_2O_3$ | 0.2 | 1.8 |
| CaO | 55.2 | 53.3 |
| MgO | 0.2 | 1.2 |
| Soluble $Na_2O$ | 0.4 | 0.1 |
| Moisture | Moisture-free | Moisture-free |

only slightly, and attributed this to better heat transfer to the sample by the steam.

Two samples of lime sludge from sulphate process plants were used in the reburning studies. Both samples were dried at 105 deg. C. before analyzing and calcining. The sources and analyses are given in Table IV.

### Calcining Procedure

The lime sludge was weighed moisture-free into 4-inch porcelain casseroles, the pieces of dry mud being broken into rough cubes about ¼ inch on edge. The uncovered casseroles plus contents were then heated in an electric muffle furnace according to the desired time-temperature schedule. After burning, the casserole was removed from the furnace, cooled, weighed, and the recovered quicklime sealed in air-tight containers. For calcining temperatures above 1100 deg. C. a gas muffle furnace and fire clay crucibles were employed. The slight fusion products of the charge and the porcelain casseroles, and the considerable fusion products with the fire clay crucibles at high temperatures were not detached and thus were not included in the quicklime samples.

Figure 2 shows the effect of calcining portions of Muds 1 and 2 for various periods of time at 1000 deg. C. These results accentuate the accepted belief that the composition of the lime mud plays an important role in the burning operation and the quality of the calcined product. The "availability" curve for Mud 1 indicates that overburning takes place after 3 hours at 1000 deg. C., while the curve for Mud 2 shows no

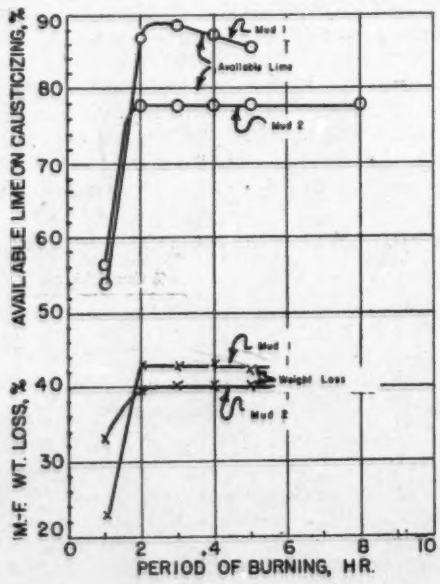


Fig. 2
Effect of Period of Burning at 1000 deg. C. on Available Lime and Weight Loss

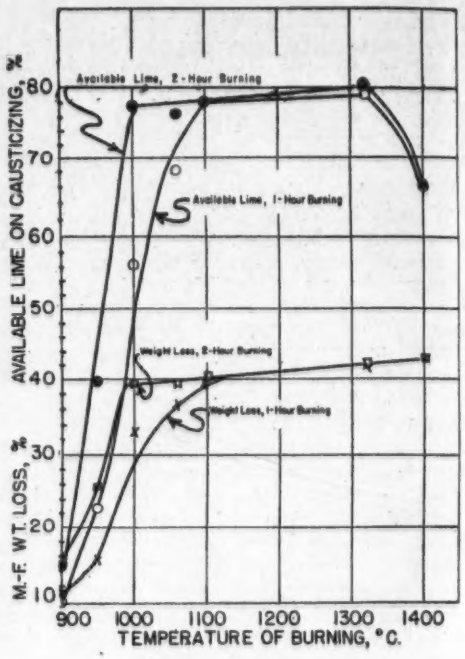
AVAILABLE LIME ON CAUSTICIZING, %
M-F WT. LOSS, %
TEMPERATURE OF BURNING, °C.
Available Lime, 2-Hour Burning
Available Lime, 1-Hour Burning
Weight Loss, 2-Hour Burning
Weight Loss, 1-Hour Burning

Fig. 3
Effect of Temperature of Burning Mud 2 on Available Lime and Weight Loss

sign of overburning even after eight hours at this temperature.

Figure 3 shows the results of calcining Mud 2 for 1 and 2 hours at temperatures from 900 to 1400 deg. C. The results are more interesting in the light of conflicting opinions of proper furnace temperature for reburning this type of mud. Lorenz *(14)* places the optimum recovery kiln temperature between 950 and 1050 deg. C.; indicating that overburning took place at 1100 deg. C. On the other hand the TAPPI textbook *(7)* placed the average kiln temperature between 2200 and 2400 deg. F. (about 1200 to 1300 deg. C.). The laboratory data appear to justify the latter information, but this information must be conservative since no information was given in the Lorenz article as to the entrained chemicals or the composition of the mud being reburned.

The effect of increasing the time of burning at the various temperatures indicated an increased completion of calcination at the lower temperatures, but from 1100 to 1400 deg. C. the increase from 1 to 2 hours had no effect. These data agree with Ray and Mather's *(11)* conclusion: "Differences in the lengths of time of burning of limestones to lime cause only minor differences in the properties of the limes formed. In general, increasing the time of burning from 2 to 10 hours has about the same effect as that of increasing the temperature of burning 50 deg. C."

## Effect of Reburning Temperature on the Behavior of Lime in Causticizing Sulphate Green Liquor

Using samples of the reburned lime from Mud 2 burned for 1 hour at temperatures from 1060 to 1400 deg. C., green liquor of 3 composition was causticized by the previously described procedure. The amount of lime used was varied to compensate for

the variation in the availability of the reburned lime, but held constant at about 2% in excess of the percentage of theoretical lime required to obtain the equilibrium causticizing efficiency. The availabilities for the samples used can be read from the 1-hour curve of Fig. 3.

The behavior of lime reburned at the various temperatures upon being used for causticizing sulphate green liquor is shown in Fig. 4. These data show that for Mud 2 the optimum reburning temperature was about 1300 deg. C. since under those conditions the sludge settled faster and gave a smaller final volume of sludge. This conflicts with the conclusion drawn by Ray and Mathers *(11)* that the slowest settling hydrates were obtained from quicklimes burned at 1100 to 1250 deg. C., with the temperatures below and above this range yielding coarse, rapid settling hydrates. The obvious reason for this conflict lies in the fact that Ray and Mathers made their settling-rate tests on the hydrates, using a constant weight of the quicklime, and were not concerned with the availabilities. Therefore, with such a settling test, under-burned and dead-burned lime would naturally settle faster than the slaked particles. However, if the availability had been taken into account by increasing the quantity of lime used when the availability was low due to either under- or over-burning, this increased quantity of material would undoubtedly change the rate of settling.

### Effect of the Lime Recovery Cycle on Recausticizing

Meade *(16)* has stated that reburned lime yielded a faster settling sludge than its "new lime" while on the other hand it causticized somewhat slower. Mount *(17)* stated that he had observed recovered lime yield a sludge that settled much faster than new lime. These statements, based on plant observations, and unsupported by actual laboratory data, prompted this phase of the investigation.

Figure 5 shows the cycle: causticizing—burning—recausticizing, on the behavior of the recovered lime. Throughout this series of tests a consistent procedure for causticizing, sludge washing, and reburning the sludge was followed and the percentage of theoretical lime was held constant at 3% in excess of the equilibrium requirements. The series started with several duplicate causticizations of Green Liquor 3 by new lime 1. The several muds were reburned for 2 hours at 1100 deg. C. and the recovered lime used to causticize more Green Liquor 3. The loss of lime by decreasing availability and washing was made up by combining the reburned limes from the same cycle, and not by adding new lime as make-up. This means that if six tests were made at the start with new lime, only five tests could be made from the reburned products.

The availability of the reburned lime decreased about 10% after 2 reburnings but apparently remained constant through further circulation. Table V presents the change in chemical composition of the lime after five cycles. It should be noted that the silica content had increased fivefold and was probably caused by the precipitation of calcium silicate by the action of the lime on the sodium silicate present in Green Liquor 3.

The effect of cycling, without addition of new

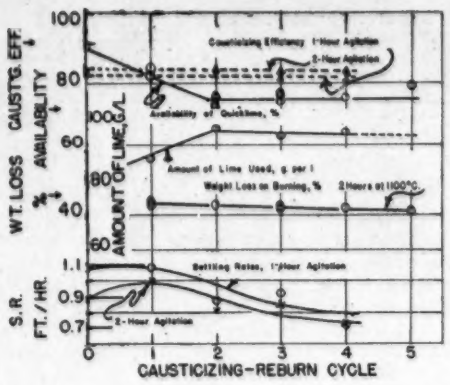


FIG. 5

**Effect of Causticizing-Reburning Cycle when No "New Lime" Was Added (Lime 1 and Green Liquor 3)**

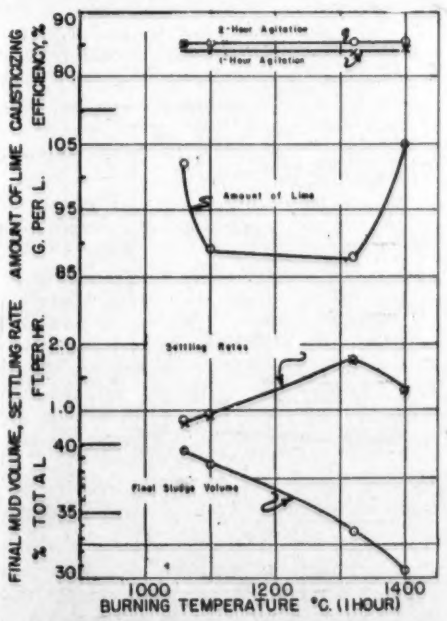


FIG. 4

**Effect of Burning Temperature (Mud 2) on Behavior of Reburned Lime in Recausticizing Sulphate Green Liquor**

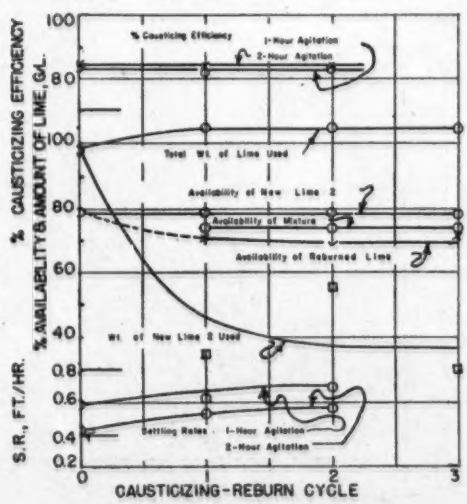


FIG. 6

**Effect of Causticizing-Reburning Cycle when New Lime Was Added (Lime 2 and Green Liquor 3)**

lime, apparently increased the settling rate of the sludge about 10% after the first reburning with subsequent decreases as the cycling continued.

These results on the settling rate, at first glance, appear to discount the published statements that recovered lime settled much faster than the initial new lime. However, in practice, a portion of new lime is added for make-up along with the reburned lime in causticizing and this addition might be expected to influence the settling properties. In order to investigate this influence, a series of tests were made using Lime 2 and Green Liquor 3, with make-up new lime added to the reburned lime to bring the availability up to the arbitrarily chosen value of 73.8%. The results of cycling under these conditions, as shown in Fig. 6 present a different picture.

With additions of about 40% new lime, and using a total amount of lime such that the percentage of theoretical lime was held constant at 93%, the settling rate was observed to increase about 20% after 2 reburnings at 1100 deg. C. for 2 hours. Therefore,

TABLE V.—EFFECT OF LIME RECOVERY-CAUSTICIZING CYCLE ON CHEMICAL ANALYSIS OF LIME

| Analysis | New Lime 1 | After 5 Cycles |
|---|---|---|
| Ignition Loss | 0.8% | 0.5% |
| $SiO_2$ + Insolubles | 1.2 | 5.4 |
| $Al_2O_3$ + $Fe_2O_3$ | 0.4 | 0.9 |
| CaO | 96.1 | 91.0 |
| MgO | 0.9 | 1.3 |
| Available Lime | 90.2 | 79.4 |

these results, although not comprehensive or general, indicate that recovered lime can produce faster settling sludges when used for causticizing, than their corresponding new lime. The magnitude of the increase in settling rate obtained in these experiments would probably have been increased if the reburning had been done at higher temperatures (*see Fig.* 4).

### Effect of Entrained Alkali in Lime on Reburning

Mount *(17)* showed the lack of definite published information on the effect of alkali on the reburning and causticizing behavior of the reburned lime. Therefore, portions of Mud 1 were prepared to contain from 0.1 to 12% free alkali, as $Na_2O$, by repulping in sodium hydroxide solutions, filtering, and drying. These samples were then calcined at 1100 deg. C. for 2 hours and the lime used to recausticize

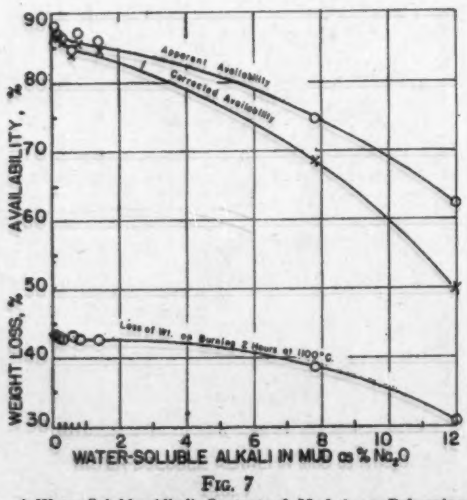
Apparent Availability
Corrected Availability
Loss of Wt. on Burning 2 Hours at 1100°C.
AVAILABILITY, %
WEIGHT LOSS, %
WATER-SOLUBLE ALKALI IN MUD as % Na2O

FIG. 7

Effect of Water-Soluble Alkali Content of Mud 2 on Reburning for 2 Hours at 1100 deg. C.

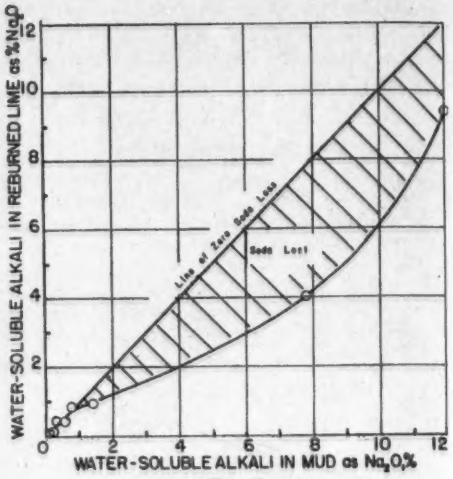


FIG. 8

Water-Soluble Alkali Lost on Burning Sulphate Lime Mud for 2 Hours at 1100 deg. C.

Green Liquor 3. The results of this series of experiments are shown in Figs. 7, 8, and 9.

The water-soluble free alkali in the mud and the reburned samples was determined by digesting for several hours with a large excess of ammonium carbonate solution, evaporating to dryness, taking up with hot water, washing the free alkali out, and finally titrating the washings to the methyl orange end point with standard acid.

The availability of the reburned lime was determined by the method previously described for new lime. The "corrected availability" was obtained by subtracting the equivalent of the $Na_2O$ content of the reburned lime from the "apparent availability".

Several interesting considerations were brought out by this series of tests. First the availability of the reburned quicklime was depressed approximately 1% for each addition of 0.1% free alkali. The reason for this result was found in an article by Niggli *(18)*, which indicated a partial melt formation between $Na_2CO_3$ and $CaCO_3$ at temperatures as low as 814

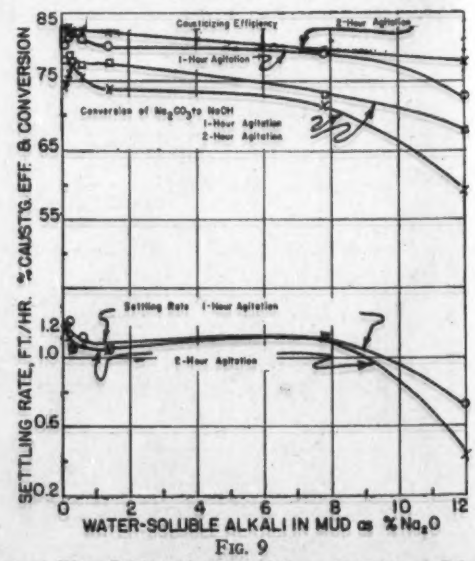
Causticizing Efficiency
1-Hour Agitation
2-Hour Agitation
Conversion of Na2CO3 to NaOH
Settling Rate 1-Hour Agitation
2-Hour Agitation
SETTLING RATE, FT./HR. % CAUSTG. EFF. & CONVERSION
WATER-SOLUBLE ALKALI IN MUD as % Na2O

FIG. 9

Effect of Water-Soluble Alkali in Mud on Behavior of Reburned Lime on Causticizing Sulphate Green Liquor

deg. C. He explained the decrease in $CO_2$ loss by a probable equilibrium in the melt:

$$CaCO_3 + Na_2CO_3 \leftrightarrows Na_2Ca(CO_3)_2$$

and,

$$Na_2Ca(CO_3)_2 \leftrightarrows Na_2CO_3 + CaO + CO_2$$

In addition, the viscous melt would clog the pores in the lime sludge and hinder the escape of the $CO_2$ from the $CaCO_3$. Second, the results shown in Fig. 8 confirm Rodowski and Knowles *(9)* in that no water-soluble alkali was lost on burning lime muds containing 1% $Na_2O$ or less. However, when the alkali content was in the range of 8 to 12% $Na_2O$, more than 20% of the alkali initially present in the mud was apparently lost.

The effect of the entrained alkali on the behavior of the reburned lime when used for causticizing sulphate green liquor is shown in Fig. 9. These results show the settling rate of the sludge dropped about 10% after an addition of 0.4% $Na_2O$ to the mud, and to regain about 5% of its former rate by the time the $Na_2O$ content reached 8%, after which there was a marked decrease. On the other hand, the causticizing efficiency and percentage conversion curves indicated that a more reactive reburned lime was obtained with 0.4% $Na_2O$ present in the mud before burning. However, there was a steady decrease in the causticizing efficiency as the alkali content increased, and this was undoubtedly due to the soda in the reburned lime serving to increase the total concentration of alkali.

Although it is not claimed that the results reported herein are directly comparable to large scale rotary kiln operation, they may explain some of the effects obtained in practice. A little soda, say about 0.4%, may be desirable as it might give a more reactive quicklime, and the small amount of melt formed would probably lessen the "dusting" of the lime out of the kiln.

With regard to the question of ring formation in the rotary kiln being caused by soda in the mud, there is such a possibility if the quantity of $Na_2O$ is high. However, Niggli *(18)* shows that $CaCO_3$ and the $SiO_2$ in the kiln lining would react to form calcium silicate, a melt and $CO_2$ at temperatures lower than 1000 deg. C. even in the complete absence of soda.

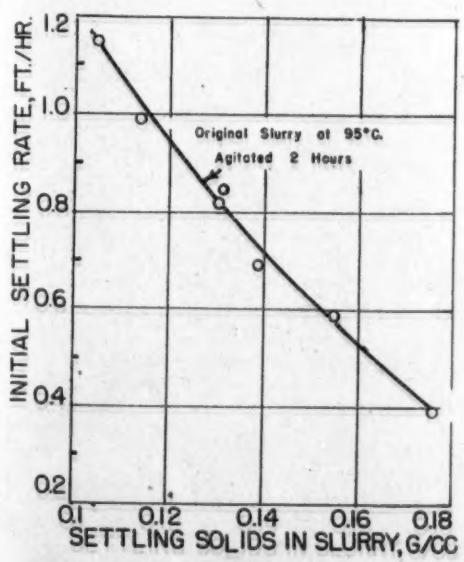


FIG. 10

**Relation between Solids Concentration and Their Settling-Rate**

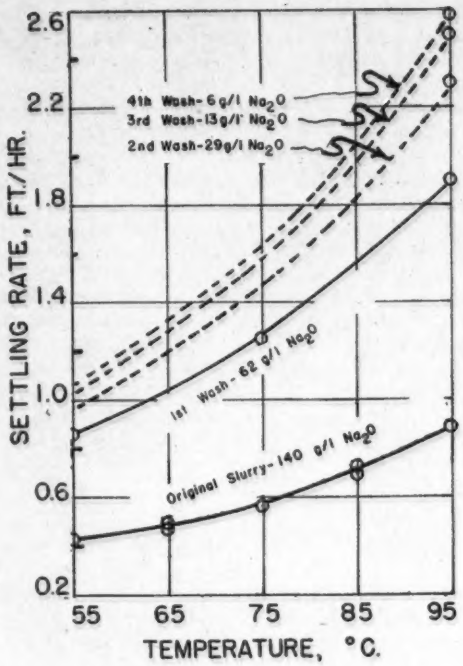


FIG. 11

**Effect of Temperature and Washing on Settling-Rate of Sulphate Lime Sludge**

## Correlation of Settling Rate of Sulphate Lime Sludge with the Physical Properties of the Causticized Liquor

Considerable information has been published on the correlation of the settling rate of aqueous suspensions of graded, as well as precipitated, solids at room temperature. The work by Coe and Clevenger *(19)* shows the design in settling tanks from settling-rate tests on slurries of various ratios of solid to liquid. Stewart and Roberts *(20)* presented a comprehensive survey of the theory and practice of the sedimentation of fine particles in liquids, McCabe and Egolf *(21)*, Deane *(22)*, Ward and Kammermeyer

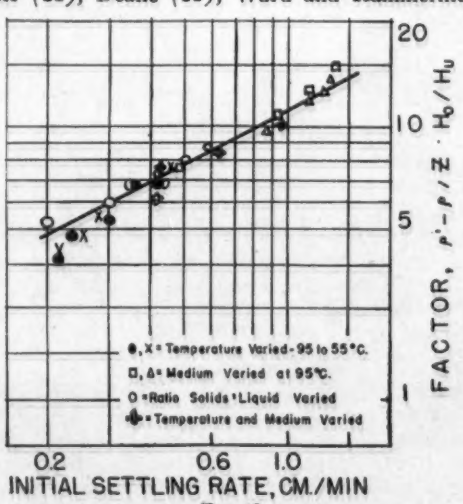


FIG. 12

**Correlation of Settling-Rate with Various Factors**

*(23)*, Comings *(24)*, Work and Kohler *(25)*, and many others have also furnished valuable concepts on the settling phenomena. No information has appeared, however, on any attempts to correlate the settling rate of the sludge from causticizing carbonate liquors or sulphate green liquors with lime. This type of sludge, in the concentrations used in industrial practice, settles with a sharp line of demarcation and is more or less flocculated.

For any one lime sludge, produced by any specific causticizing procedure, the settling rate would be expected to decrease as the concentration of settling solids in the slurry increases. Figure 10 shows the effect of this variable on a sludge resulting from causticizing Green Liquor 3 with Lime 1 using 3% excess over the amount required to attain the equilibrium conversion value. These tests were all carried out at 95 deg. C. and the ratio of solids to liquid was varied by removing and adding clear supernatant white liquor of the same composition as that already present.

### Sludge Floc

It is logical to expect that a causticized slurry of sulphate green liquor and lime mud would settle slower at low temperatures than at higher ones since the driving force, namely the difference in density between the sludge floc and the clear liquid would be decreased due to the increase in density of the liquid medium on cooling. In addition, the liquid suspension would become more viscous as the temperature dropped and thus offer more resistance to the settling motion of the flocs.

Washing, on the other hand, would be expected to have the opposite effect to the lowering of temperature. Washing would decrease the liquid density and decrease the viscous resistance of the liquid. Fig. 11 shows the effect of washing and temperature change on the settling rate of the sulphate lime sludge described in Fig. 10. The Fig. 11 concentration of settling solids in the slurry was held constant at about 0.13 grams per cc. of slurry, the original causticized slurry value.

### Factor Modification

After trying modifications of the correlation method it was found that the most promising modification consisted of the use of the factor:

$$\frac{\rho' - \rho}{Z} \cdot \frac{H_o}{H_u}$$

where, $\rho'$ = density of settling solids in grams/cc.
$\rho$ = density of clear liquid in grams/cc.
$Z$ = viscosity of the clear liquid in centipoises.
$H_o$ = original height of suspension.
$H_u$ = final settled sludge height.

A log-log plot of the initial or straight-line settling rate of the sludge *versus* this factor gave a straight line having a slope of 0.5 with respect to the settling rate axis as shown in Fig. 12. This correlation was found to be consistent, for any specific lime, over wide ranges of temperature, liquid to solid ratio, and amount of alkali in suspension medium, with a maximum deviation of 20%.

## Conclusions

The use of lime in excess of the equilibrium conversion requirement in the causticization of sulphate green liquor increased the difficulty of washing the alkali from the sludge, increased the final sludge volume, and decreased the settling rate of the sludge.

The sodium sulphide in sulphate green liquor not only caused an abnormal decrease in the equilibrium causticizing efficiency and the settling rate of the sludge, but also slowed down the rate of causticization.

An empirical mathematical expression correlating the equillbrium causticizing efficiency with the initial concentrations of NaOH, $Na_2S$, $Na_2CO_3$, and $Na_2SO_4$ present in the sulphate green liquors was shown to be valid for three green liquors taken from different sulphate pulp mills.

The results of recycling lime particles through the causticizing-reburning-causticizing cycle and of reburning at various temperatures indicated that the recovered lime could causticize as well, producing a faster settling sludge than the corresponding new lime and that the most reactive reburned lime was one that was derived from a sludge containing about 0.4% free $Na_2O$.

The free alkali entrained in the lime sludge lowers the availabilty of the reburned lime when greater than 1% is present (approximately 1% for each 0.1% free alkali) and also high alkali contents appear to result in the loss of alkali on reburning.

The McCabe-Egolf method for correlating settling-rate data may be applied to the sludges resulting from the causticization of sulphate green liquors, in a much simplified form which is valid over a range of temperatures, solid to liquid ratio, and also dilution or washing.

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# Imports of Paper and Paper Making Stock

## Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

**Importers may have their shipments listed in these columns by submitting records of imports to this publication.**

### NEW YORK IMPORTS

WEEK ENDING FEBRUARY 21, 1942

SUMMARY

Newsprint .....5,646 rolls

NEWSPRINT

——, ——, ——, 5,646 rolls.

RAGS, BAGGINGS, ETC.

Camden Fibre Mills, ——, ——, 137 bls. cotton linters.
Esteve Bros., & Co., Inc., ——, ——, 204 bls. cotton linters.
Volkart Bros., Inc., ——, ——, 979 bls. cotton linters.
West Texas Cottonoil Co., ——, ——, 2,410 bls. cotton linters.
Lush Cotton Products Co., ——, ——, 473 bls. cotton linters.
Philadelphia National Bank, ——, ——, 90 bls. cotton picker waste.
Kauders Steuber & Co., ——, ——, 1,616 bls. cotton linters.
Williamson Products Co., ——, ——, 140 bls. cotton linters.
New England Waste Co., ——, ——, 523 bls. motes.
Williamson Products Co., ——, ——, 146 bls. cotton residue.
Chase National Bank, ——, ——, 770 bls. cotton residue.
Gillespie & Co., ——, ——, 323 bls. cotton linters.
Schimmel Trading Co., ——, ——, 259 bls. cotton picker waste.
Lush Cotton Products Co., ——, ——, 108 bls. cotton residue.
C. Kutz, ——, ——, 160 bls. cotton residue.
——, ——, ——, 231 bls. cotton linters.
Schimmel Trading Co., ——, ——, 79 bls. cotton waste.
New England Waste Co., ——, ——, 90 bls. cotton linters.
W. Intner & Co., ——, ——, 31 bls. cotton waste.
Riverside Mills, ——, ——, 116 bls. cotton picker waste.

BONE GLUE

Prague Credit Bank, ——, ——, 400 bags bone glue.
Prague Credit Bank, ——, ——, 600 bags bone glue sheets.

## Norburt McKenna Resigns

WASHINGTON, D. C., February 25, 1942—Norburt A. McKenna, chief of the pulp and paper branch of the War Production Board, disclosed tonight that he would resign his post tomorrow. It was reported that Mr. McKenna, formerly vice president of the United States Plywood Corporation and head of the branch since last July, would be succeeded by David Winton, part owner of the Winton Lumber Company, Minneapolis.

## B. C. Starts Reforestation

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., February 21, 1942—Reforestation will be launched in earnest in British Columbia this year according to the Hon. A. Wells Gray Minister of Lands. The B. C. Government Forestry Branch started its spring program and planting campaign early in February on denuded areas of logged over lands on Vancouver Island according to Mr. Gray.

Tree production has now been accelerated in the two forest branch nurseries, following the Lands Department's policy to plant 10,000,000 trees per annum.

"For the first time, 1942 nursery production will provide sufficient planting stock to carry out artificial reforestation on a large scale," Mr. Gray said. "The significance of this advance is more readily realized when it is noted that during 1940 only 1,300,000 trees were planted."

Five plantations will be put in this spring at Lower Campbell Lake, Quinsam Lake, Bowser, Timberlands and Hill 60, near Cowichan Lake. Between 350 and 400 men will be required to accomplish this work. Planters will be housed in four main camps of 75 men each and in addition sufficient labor for one project will be obtained through local residents living within close proximity to the plantations.

Planting stock will consist chiefly of Douglas fir, although some western hemlock and western red cedar will also be used. All the trees are grown at the forest branch nurseries in the Fraser Valley and in the vicinity of Campbell River.

## Specialty Converters Get Insurance

Three-way security for employees of Specialty Converters, Inc., manufacturers of paper specialties, of East Braintree, Mass., has been provided by the corporation through the adoption of a group insurance program which includes life insurance, sickness and accident, and hospital expense benefits. Announcement of the plan was made by Frank E. Donovan, president.

The group plan is being underwritten by the Metropolitan Life Insurance Company on a cooperative basis whereby the employees contribute fixed amounts and the employer bears the balance of the entire net cost.

Under the terms of the plan, general employees receive $1,000 life insurance. In case of sickness or non-occupational injury they will receive $10.50 a week, while $4 a day for a maximum period of 31 days will be paid to them in the event of hospitalization.

The plan also includes visiting nurse care and the distribution of pamphlets on health conservation and disease prevention.

# New York Paper and Pulp Market Review

## Paper Market Active With Demand For Container Board and Wrapping Paper Heavy—Pulp Market Strong—Demand For Old Rope and Scrap Bagging Continues Steady—Paper Market Active.

Office of the PAPER TRADE JOURNAL
Wednesday, February 25, 1942.

Demand reflected in orders and shipments in the wholesale paper market at this date, apparently indicates the easier future pace of business quite widely forecasted by government and other business economists. The restrictions and discontinuance of several major lines of products, such as refrigerators, etc., considered less essential for civilian use during the conduct of the war, is expected to result in a severe dislocation of employment. This will bring changes into business and the normal buying habits of the nation. Because of the great utility of paper, new uses for which are frequently being found, the production and demand for the most widely used grades is expected to be maintained at a high level throughout the current year.

The index of general business activity for the week ended February 14, declined to 134.9% from 136.6% for the preceding week, compared with 124.3% for the corresponding week last year. Paper board production was fractionally lower.

Paper production for the week ended February 14 was estimated at 103.1%, compared with 89.3% for 1941, with 86.6% for 1940, with 82.6% for 1939, and with 68.4% for the corresponding week for 1938.

Paper board production for the week ended February 14 was 101.0%, compared with 81.0% for 1941, with 86.0% for 1940, with 67.0% for 1939, and with 60.0% for the corresponding week for 1938.

Demand for major grades of paper is active, with orders for container board and wrapping paper heavy. Difficulty is reported by many merchants in maintaining a well balanced distribution of paper to customers. The WPB is reported to be studying the situation with a view of taking proper remedial action whenever it seems practicable and necessary. The broadest possible distribution of paper for civilian needs, with minimum inventories in the hands of merchants, is the policy which the WPB has outlined up to the present time.

The price situation is well stabilized through voluntary agreements and while some price irregularities are reported, OPA controlling measures are considered as having a stabilizing effect adequate to keep prices from rising too rapidly and too high. A repetition of the soaring prices following the first world war, is not likely to occur in paper as a result of this conflict, is the reassuring expectation voiced by some government officials.

### Chemical Pulp

The total available supply of chemical woodpulp for the current year is made uncertain by the all-over government requirements. The estimate that about 200,000 tons of sulphite pulp will be removed from the total available supply this year, seems a conservative tonnage at this date, according to opinions expressed in some quarters of the trade.

The supply situation of mills which purchase pulp is complicated by the unknown factors of actual government needs, the possibility that standardization and simplification plans of the government may require less tonnage than the current estimates, and that the proposal of a strict rationing plan in which the government will determine the priority ratings, may be eventually adopted.

Current demand continues heavy, with prices strong and unchanged at prevailing contract quotations, which have been stabilized for the time being through voluntary agreements.

### Rags

Mill buying of new cotton cuttings continues steady in good volume. Prices are firm under the influence of moderate supplies. Demand for the mixed or roofing grades of old rags is reported active.

### Old Rope and Bagging

Mill buying continues to absorb about all the supplies of old Manila rope available. Prices are now officially stabilized at $115.00 per ton, by the OPA, on No. 1 domestic Manila.

Bagging prices are reported steady, with the OPA maximum prices of 1.35 on the roofing grade.

### Old Waste Paper

Demand for the bulky grades of waste paper is reported active at this date. OPA maximum prices prevail, lower truck charges on the mileage basis, recently adopted by the OPA, is reported in some quarters of the trade to result in shortage of supplies delivered to some New Jersey mills.

### Twine

The supply situation in some imported fibers continues to inject uncertainty as to an adequate supply in the future. Prices are firm on all standard grades of hard and soft fiber twines.

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## A. R. Mumford Goes with Combustion

J. V. Santry, president of Combustion Engineering Company, Inc., announces the appointment of Albert R. Mumford, effective February 16, to the Research Department of that company, under the direction of Henry Kreisinger.

A graduate of Massachusetts Institute of Technology, Class of 1918, Mr. Mumford's background in fuels, combustion and steam generation covers four years as assistant fuels engineer of the U. S. Bureau of Mines, over fifteen years as research and design engineer with the New York Steam Corporation and from October 1938 to February 1942 as assistant director of research of the Consolidated Edison Company of New York. He has long been active in committee work of the American Society of Mechanical Engineers, the National District Heating Association, the American Society of Heating and Ventilating Engineers and the American Society of Testing Materials, and is the author of numerous technical papers.

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Coolidge Chip Packer
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Blow Steam Plants
Thune Pressure Filter
Norman Chip Duster
Drammen Blow Valve
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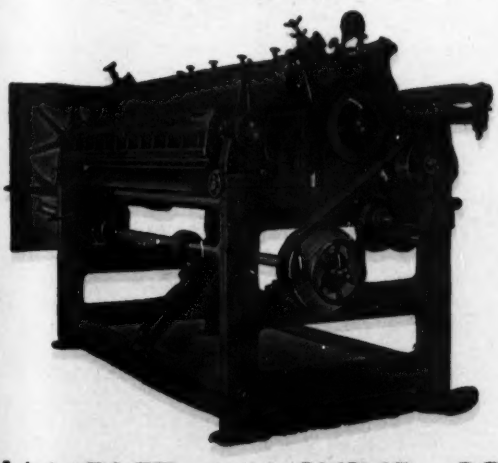
# ROLLER BEARING CUTTER



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# MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL
Wednesday, February 25, 1942.

BLANC FIXE—Quotations on blanc fixe are firm and continue unchanged at prevailing market levels. Situation less tight at this date. The pulp is currently quoted at $40 per ton in barrels, at works; the powder is offered at $60 per ton, f.o.b., works.

BLEACHING POWDER—Prices on bleaching powder are firm. Market reported strong for the week. Prices stabilized by agreement with OPA. Bleaching powder is currently quoted at $2.25 per 100 pounds, in drums, at works.

CASEIN—Quotations on casein are firm. Demand reported fair for the week. Standard domestic casein, 20-30 mesh, is currently quoted at 27 cents per pound; 80-100 mesh at 27½ cents per pound; all prices in bags, car lots. Standard Argentina casein is currently offered at 24 cents per pound, c.i.f. No quotations on French casein.

CAUSTIC SODA—Prices on caustic soda are reported firm. Demand active for the current week. Solid caustic soda is currently quoted at $2.30 per 100 pounds, flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay at from $12 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Quotations on chlorine unchanged. Market under full priority control, with full allocation on February 1. Chlorine is currently quoted at from $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—Quotations on some grades of rosin are unchanged for the current week. "G" gum rosin is currently quoted at $3.18 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $3.18 per 100 pounds in barrels, New York. Seventy per cent gum rosin size is quoted at $3.47 per 100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm. Demand active for the current week. Domestic salt cake is currently quoted at $15 per ton in bulk; chrome salt cake at $16 per ton. All prices in car lots, f.o.b., shipping point. Quotations on imported salt cake are nominal at $16 per ton.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market quotations. Demand reported heavy. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch continue unchanged for the current week. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds; all prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Demand reported active. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at from $1.75 to $1.85 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices of sulphur are firm and continue to conform to prevailing market quotations. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $18 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, at mills. No quotations on imported talc.

# MARKET QUOTATIONS

## Paper

(Delivered New York)

| | | | |
|---|---|---|---|
| News, per ton— | | | |
| Roll, contract | $50.00 | @ | — |
| Sheets | 58.00 | " | — |
| **Kraft—per cwt.—Delivered Zone A** | | | |
| Northern, Extra Quality | $6.00 | @ | $7.00 |
| Superstandard | 5.25 | " | 6.25 |
| Northern Standard Wrapping | 4.75 | " | 5.25 |
| Standard Wrapping | 4.75 | " | — |
| **Tissues—Per Ream—Carlots** | | | |
| White No. 1 | 1.12½ | " | — |
| White No. 1 M. G. | 1.05 | " | — |
| White No. 1½ | 1.00 | " | — |
| White No. 2 | 1.00 | " | — |
| Anti-Tarnish M. G. | .95 | " | — |
| Colored | — | " | — |
| Kraft | .95 | " | — |
| Manila | .90 | " | — |
| Unbl. Toilet, 1 M. | 4.16 | " | — |
| Bleached Toilet | 5.70 | " | — |
| **Paper Towels, Per Case—** | | | |
| Unbleached, Jr. | 2.35 | " | — |
| Bleached, Jr. | 2.65 | " | — |
| **Manila—per cwt.—C. l. f. a.** | | | |
| No. 1 Jute | 8.75 | @ | 10.75 |
| No. 1 Manila Wrapping, 35 lb. | 5.50 | " | 5.75 |
| No. 2 Manila Wrapping, 35 lb. | 5.25 | " | 5.50 |

| | Maximum Base Price Per Ton (2000 lbs.) | 1-3 Tons Inclusive | 4-9 Tons Inclusive | 10 Tons or Over |
|---|---|---|---|---|
| Plain Chip | *45.00 | +$5.00 | +$2.50 | +$1.50 |
| Filled News | *45.00 | + 8.00 | + 5.50 | + 1.00 |
| Sgl. Mla. Ll. Chip | *60.00 | + 5.00 | + 2.50 | Base |
| No. 1 Sgl. White Pat. Coated, Ga. List No. 6, .020 and heavier | *75.00 | + 5.00 | + 2.50 | Base |
| Kraft Fourdinier Liner, 50$ Per M sq. ft. | *1.50 | | | |
| Binders Board | 80.00 | | | |

* OPA Maximum Prices.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

| | Bonds | | Ledgers |
|---|---|---|---|
| 100% Rag Ext. No. 1 | $40.25 | @ | $47.25 $41.40 @ $48.50 |
| 100% Rag | 32.20 | " | 37.75 33.35 " 39.25 |
| 85% Rag | .... | " | .... 32.20 " 37.75 |
| 75% Rag | 24.75 | " | 29.00 25.90 " 30.50 |
| 65% Rag | .... | " | .... 22.80 " 27.75 |
| 50% Rag | 18.70 | " | 22.75 19.90 " 24.25 |
| 25% Rag | 16.40 | " | 20.00 17.55 " 21.50 |

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

| | Bonds | | Ledgers |
|---|---|---|---|
| No. 1 | $10.55 | @ | $12.75 $11.70 @ $14.25 |
| No. 2 | 9.65 | " | 11.75 10.80 " 13.25 |
| No. 3 | 9.20 | " | 11.25 10.35 " 12.50 |
| No. 4 | 8.90 | " | 10.75 10.05 " 12.25 |

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper.

Delivered in Zone 1:

| | | | |
|---|---|---|---|
| No. 1 Glossy Coated | $13.65 | @ | $15.50 |
| No. 2 Glossy Coated | 12.40 | " | 14.00 |
| No. 3 Glossy Coated | 11.60 | " | 13.25 |
| No. 4 Glossy Coated | 11.15 | " | 12.75 |
| No. 1 Antique (watermarked) | 10.25 | " | 11.75 |
| No. 2 Offset | 9.60 | " | 11.00 |
| A Grade E. F. | 9.35 | " | 10.75 |
| A Grade S. & S. C. | 9.60 | " | 11.00 |
| B Grade E. F. | 8.85 | " | 10.25 |
| B Grade S. & S. C. | 9.10 | " | 10.50 |
| C Grade E. F. | 8.55 | " | 9.75 |
| C Grade S. & S. C. | 8.80 | " | 10.00 |
| D Grade E. F. | 8.25 | " | 9.50 |
| D Grade S. & S. C. | 8.50 | " | 9.75 |

Ivory & India at $.50 cwt. extra.

## Mechanical Pulp

(On Dock, Atlantic Ports)

| | | | |
|---|---|---|---|
| No. 1 Imported— | | | |
| Moist | No price | | |
| Dry | No price | | |
| (Delivered) | | | |
| No. 1 Domestic and Canadian | 40.00 | @ | 45.00 |

## Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

| | | | |
|---|---|---|---|
| Bleached Sulphite (Domestic and Foreign)— | | | |
| Prime Bleached Sulphite | 3.62½ | @ | 4.71 |
| Prime Qualities—Easy-Bleaching Sulphite | 3.17½ | " | 4.31 |
| Strong Unbleached Sulphite | 3.17½ | " | 4.31 |
| News Grade, delivered Unbleached Sulphite | 63.75 | " | 67.71 |
| (On Dock, Atlantic Ports) | | | |
| Kraft Bleached | 4.12½ | " | — |
| Kraft Light & Strong | No price | | |
| Kraft No. 1 | No prices | | |
| (Delivered) | | | |
| Kraft Domestic and Canadian | 3.00 | " | 4.00 |
| (Delivered) | | | |
| Soda Bleached | 3.30 | " | — |

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

## Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White, No. 1 | 8.00 | @ | 8.25 |
| Silesias No. 1 | 4.50 | " | 4.75 |
| New Unbleached | 8.00 | " | 8.25 |
| Blue Overall | 5.75 | " | 6.00 |
| Fancy | 3.00 | " | 3.25 |
| Washables | 2.50 | " | 2.75 |
| Mixed Khaki Cuttings | 2.50 | " | 2.75 |
| O. D. Khaki Cuttings | 3.00 | " | 3.15 |

Old Rags

| | | | |
|---|---|---|---|
| White, No. 1— | | | |
| Repacked | *3.80 | " | — |
| Miscellaneous | *3.20 | " | — |
| White, No. 2— | | | |
| Repacked | *2.90 | " | — |
| Miscellaneous | *2.65 | " | — |
| Third and Blues— | | | |
| Repacked | *2.20 | " | — |
| Miscellaneous | *1.80 | " | — |
| Roofing Rags— | | | |
| No. 1 | *1.55 | " | — |
| No. 2 | *1.45 | " | — |
| No. 3 (bagging) | *1.35 | " | — |
| No. 4 | *1.35 | " | — |
| No. 5A | *1.35 | " | — |
| * Old Manila Rope | 5.75 | " | — |

*OPA Maximum Prices.

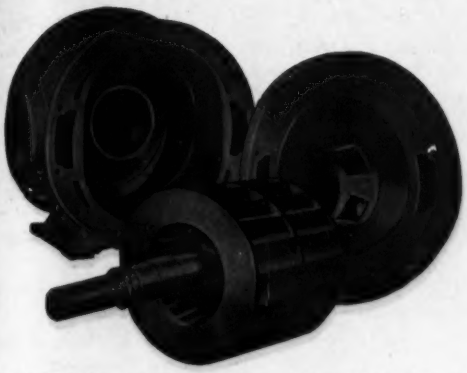
## Foreign Rags

All prices nominal

New Rags

| | | | |
|---|---|---|---|
| New Dark Cuttings | 2.25 | @ | 2.40 |
| New Mixed Cuttings | 2.00 | " | 2.30 |
| New Light Silesias | 5.50 | " | 5.75 |

# SIMPLICITY



NASH VACUUM PUMPS HAVE ONE MOVING PART

Operating advantages made possible by the Nash principle, and present in no other type of vacuum pump, permit a new level of operating economy. Nash Vacuum Pumps have but one moving part, a rotor cast in one piece, and revolving without metallic contact. There are no valves, no pistons or sliding vanes, no internal parts requiring wear adjustment or lubrication.

NASH ENGINEERING COMPANY
SOUTH NORWALK, CONNECTICUT, U. S. A.

# THE CANNARD COMPANY

*Paper Making & Paper Finishing Machinery*

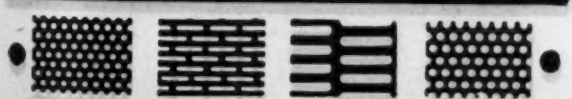
Winders, Wrappers, Banders and Printers for various types of packages.

Longitudinal Cross and Double Crepe Machines.

K-NARDS for refining Screenings, Pulps, Clays, Colloids, Paints and Ink.

1120 Madison Street — Little Chute, Wisconsin

# SCREENS
of Perforated Metal



The Harrington & King Perforating Co.

5222 Fillmore St. Chicago Ill. 114 Liberty St. New York N.Y.

# PARIS II *Black*

WETS EASILY

FREEDOM from oiliness and coarse agglomerates are the reasons why PARIS II Black is particularly easy to disperse. Even distribution and uniform color result from the ultra-microscopic fineness of its particles.

**Use PARIS II Black in your black and gray paper stocks with assurance of:**

HIGHEST TINCTORIAL STRENGTH

•

EXCEPTIONAL UNIFORMITY

•

EASE OF HANDLING

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*Compressed or Semi-Compressed for Jet Black Papers*

*Uncompressed for Tinting Gray Stocks*

A COLUMBIAN COLLOID

We invite technical inquiry

COLUMBIAN CARBON CO. • BINNEY & SMITH CO.
MANUFACTURER — DISTRIBUTOR

41 East 42nd St., New York, N. Y.

| | | | |
|---|---|---|---|
| Light Flannelettes | 5.50 | " | 5.75 |
| New White Cuttings | 7.00 | " | 7.50 |
| New Light Oxfords | 4.00 | " | 4.50 |
| New Light Prints | 3.00 | " | 3.25 |

**Old Rags**

| | | | |
|---|---|---|---|
| No. 1 White Linens | 7.50 | " | 8.50 |
| No. 2 White Linens | 6.50 | " | 7.50 |
| No. 3 White Linens | 4.50 | " | — |
| No. 4 White Linens | 4.25 | @ | 4.25 |
| No. 1 White Cotton | 4.25 | " | 4.75 |
| No. 2 White Cotton | 3.25 | " | 3.75 |
| No. 3 White Cotton | 2.50 | " | 3.00 |
| No. 4 White Cotton | 1.90 | " | 2.20 |
| Extra Light Prints | 2.00 | " | 2.40 |
| Ord. Light Prints | 1.75 | " | 2.15 |
| Med. Light Prints | 1.55 | " | 1.95 |
| Dutch Blue Cottons | 2.25 | " | 2.50 |
| French Blue Linens | 3.00 | " | — |
| Checks and Blues | 2.08 | " | — |
| Linsey Garments | 1.90 | " | 2.00 |
| Dark Cottons | 1.50 | " | 1.60 |
| Old Shopperies | 1.30 | " | 1.45 |
| New Shopperies | 1.45 | " | 1.50 |
| French Blues | 2.25 | " | 2.50 |

## BAGGING

(Prices to Mill, f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| Gunny No. 1— | | | |
| Foreign | Nominal | | |
| Domestic | 4.00 | @ | 4.25 |
| Wool Tares, light | 4.25 | " | 4.50 |
| Wool Tares heavy | 4.50 | " | 4.75 |
| Bright Bagging | 3.50 | " | 3.75 |
| Jute Threads | 4.00 | " | 4.25 |
| Sisal Strings | 2.75 | " | 3.00 |
| Mixed Strings | 1.10 | " | 1.20 |

## Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices

| | | | |
|---|---|---|---|
| No. 1 Hard White Envelope Cuts, one cut | 3.37½ | @ | — |
| No. 1 Hard White Envelope Cuts | 3.12½ | " | — |
| No. 1 Hard White Shavings, unruled | 2.87½ | " | — |
| No. 1 Hard White Shavings, ruled | 2.50 | " | — |
| Soft White Shavings, one cut | 2.87½ | " | — |
| No. 1 Soft White Shavings | 2.50 | " | — |
| Soft White Shavings, Misc. | 2.15 | " | — |
| No. 1 Fly Leaf Shavings | 1.67½ | " | — |
| No. 2 Fly Leaf Shavings | 1.12½ | " | — |
| No. 1 Groundwood Fly Leaf Shavings | 1.25 | " | — |
| No. 2 Mixed Groundwood Fly Leaf Shavings | .90 | " | — |
| Mixed Groundwood Colored Shavings | .75 | " | — |
| Mixed Groundwood Colored Shavings | .90 | " | — |
| Overissue Magazines | 1.67½ | " | — |
| No. 1 Heavy Books & Magazines | 1.57 | " | — |
| Mixed Books | 1.07½ | " | — |
| No. 1 White Ledger | 2.17½ | " | — |
| No. 2 Mixed Ledger, colored | 1.87½ | " | — |
| New Manila Envelope Cuttings, one cut | 2.87½ | " | — |
| New Manila Envelope Cuttings | 2.65 | " | — |
| Extra Manilas | 1.85 | " | — |
| Mixed Kraft, Env. & Bag Cuttings | 2.75 | " | — |
| Kraft Envelope Cuttings | 3.25 | " | — |
| Triple Sorted, No. 1 Brown Soft Kraft | 2.50 | " | — |
| New 100% Kraft Corrugated Cuttings | 2.25 | " | — |
| No. 1 Assorted Old Kraft | 1.75 | " | — |
| New Jute Corrugated Cuttings | 1.75 | " | — |
| Old Corrugated Containers | 1.00 | " | — |
| Box Board Cuttings | .72½ | " | — |
| White Blank News | 1.65 | " | — |
| Overissue News | .85 | " | — |
| No. 1 News | .75 | " | — |
| No. 1 Mixed Paper | .70 | " | — |

## Twines

(F. o. b. Mill)

(Soft Fiber)

| | | | |
|---|---|---|---|
| Coarse Polished— | | | |
| India | .21 | @ | — |
| White Hemp | .21 | " | — |
| Fine Polished— | | | |
| Fine India | .26 | " | — |
| Unpolished— | | | |
| Box | .17¼ | " | — |
| Paper Makers | .17 | " | — |
| Tube Rope | .19 | " | — |
| Wall Paper | .20½ | " | — |
| Wrapping | .23 | " | — |
| Soft Fiber Rope | .19 | " | — |
| Cotton | .25 | " | — |

(Hard Fiber)

| | | | |
|---|---|---|---|
| Medium Java | .18 | " | — |
| Mex. Sisal | .16 | " | — |
| Manila | .26 | " | — |

# PHILADELPHIA

## Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White No. 1 | .07¼ | @ | .07½ |
| New White No. 2 | .04½ | " | .05 |
| Light Silesias | .04½ | " | .04¾ |
| Silesias, No. 1 | .04 | " | .04¼ |
| Black Silesias, soft | .03¾ | " | .04 |
| New Unbleached | .07¼ | " | .07½ |
| Washable Prints | .03¾ | " | .03¾ |
| Washable No. 1 | .02 | " | .02¼ |
| Blue Overall | .04½ | " | .05½ |
| Cottons—According to grades— | | | |
| Washable shredding | — | " | .01¾ |
| Fancy Percales | .03½ | " | .03½ |
| New Black Soft | .02¾ | " | .03 |
| New Dark Seconds | 1.75 | " | 2.00 |
| Khaki Cuttings— | | | |
| No. 1 O. D. | .03 | " | .03¾ |
| No. 2 Mixed | .02¾ | " | .02½ |
| Corduroy | .01¾ | " | .02¼ |
| New Canvas | .04¾ | " | .05¼ |
| New Black Mixed | — | " | .02½ |

## Domestic Rags (Old)

| | | | |
|---|---|---|---|
| White No. 1—Repacked | 3.80 | " | — |
| White No. 2—Repacked | 2.90 | " | — |
| Miscellaneous No. 1 | 3.20 | " | — |
| Miscellaneous No. 2 | 2.65 | " | — |
| Thirds and Blues— | | | |
| Miscellaneous | 1.80 | " | — |
| Repacked | 2.20 | " | — |
| Black Stockings— | | | |
| (Export) | Nominal | | |
| Roofing Stock— | | | |
| Foreign No. 1 | Nominal | | |
| Domestic No. 1 | 1.55 | " | — |
| Domestic No. 2 | 1.45 | " | — |
| Roofing Bagging | 1.35 | " | — |
| Old Manila Rope | 5.75 | " | — |

## Bagging

(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Gunny, No. 1— | | | |
| Foreign | Nominal | | |
| Domestic | 3.00 | " | 3.50 |
| Sisal Rope | 3.75 | " | — |
| Mixed Rope | .75 | " | 1.00 |
| Scrap— | | | |
| No. 1 | 3.25 | " | 3.50 |
| No. 2 | 1.75 | " | 1.80 |
| Wool Tares, heavy | 4.00 | " | 4.25 |
| No. 1 New Light Burlap | 3.00 | " | 4.00 |
| New Burlap Cuttings | 3.75 | " | 4.00 |

## Old Papers

(F. o. b. Phila.)

OPA Maximum Prices

| | | | |
|---|---|---|---|
| No. 1 Hard White Envelope Cuts, one cut | 3.37½ | " | — |
| No. 1 Hard White Shavings, unruled | 2.50 | " | — |
| Soft White Shavings, one cut | 2.87½ | " | — |
| White Blank News | 1.65 | " | — |
| Soft White Shavings, Misc. | 2.15 | " | — |
| No. 1 White Ledger | 2.17½ | " | — |
| No. 2 Ledger, colored | 1.87½ | " | — |
| No. 1 Heavy Books & Magazines | 1.57 | " | — |
| Overissue Magazines | 1.67½ | " | — |
| New Manila Envelope Cuttings | 2.65 | " | — |
| No. 1 Assorted Old Kraft | 1.75 | " | — |
| No. 1 Mixed Paper | .70 | " | — |
| Box Board Cuttings | .72½ | " | — |
| Jute Corrugated Cuttings | .90 | " | — |
| Overissue News | .85 | " | — |
| No. 1 News | 1.00 | " | — |

# BOSTON

## Old Papers

(F. o. b. Boston)

OPA Maximum Prices

| | | | |
|---|---|---|---|
| No. 1 Hard White Shavings, unruled | 2.87½ | * | — |
| No. 1 Hard White Shavings, unruled | 2.87½ | " | — |
| No. 1 Hard White Shavings, ruled | 2.50 | " | — |
| Soft White Shavings, Misc. | 2.15 | " | — |
| No. 1 Fly Leaf Shavings | 1.67½ | " | — |
| No. 2 Fly Leaf Shavings | 1.12½ | " | — |
| No. 1 Groundwood Fly Leaf Shavings | 1.25 | " | — |
| No. 2 Groundwood Fly Leaf Shavings | .90 | " | — |
| Mixed Colored Shavings | .75 | " | — |
| New Manila Envelope Cuts, one cut | 2.87½ | " | — |
| Hard White Envelope Cuts, one cut | 3.37½ | " | — |
| Triple Sorted No. 1 Brown Soft Kraft | 2.50 | " | — |
| Mixed Kraft Env. & Bag Cuttings | 2.75 | " | — |
| Kraft Envelope Cuttings | 3.25 | " | — |
| No. 1 Heavy Books & Magazines | 1.57 | " | — |
| New Manila Envelope Cuts, one cut | 2.87½ | " | — |
| New Manila Envelope Cuttings | 2.65 | " | — |
| White Blank News | 1.65 | " | — |
| No. 1 Assorted Old Kraft | 1.75 | " | — |
| No. 1 Mixed Paper | .70 | " | — |
| Overissue News | .85 | " | — |
| Box Board Cuttings | .72½ | " | — |
| Old Corrugated Containers | .82½ | " | — |
| Jute Corrugated Cuttings | .90 | " | — |

## Bagging

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Gunny Bagging— | | | |
| Foreign | (nominal) | | |
| Domestic | 4.25 | @ | — |
| Sisal Rope | 4.00 | " | 4.25 |
| Mixed Rope | 1.00 | " | 1.25 |
| Transmission Rope— | | | |
| Foreign | (nominal) | | |
| Domestic | 3.50 | " | 3.75 |
| Manila Rope— | | | |
| Foreign | (nominal) | | |
| Domestic | 5.75 | " | —* |
| Soft Jute Rope | 5.25 | " | 5.50 |
| Jute Carpet Threads | 3.25 | " | 3.50 |
| Bleachery Burlap | 8.00 | " | 8.50 |
| Scrap Burlap— | | | |
| Foreign | (nominal) | | |
| Domestic | — | " | 4.00 |
| Scrap Sisal | 4.00 | " | 4.25 |
| Scrap Sisal for Shredding | 4.25 | " | 4.50 |

| | | | |
|---|---|---|---|
| Wool Tares— | | | |
| Foreign | (nominal) | | |
| Domestic | 4.00 | " | 4.25 |
| Aust. Wool Pouches | 5.25 | " | 5.50 |
| New Burlap Cuttings | 4.50 | " | 5.00 |
| Heavy Baling Bagging | 5.00 | " | 5.50 |
| Paper Mill Bagging | 3.00 | " | 3.25 |
| No. 2 Bagging | 1.35 | " | — |

* OPA Maximum Price.

## Domestic Rags (New)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New Light Prints | .04½ | @ | .04¾ |
| Fancy Percales | .04¼ | " | .05 |
| New White No. 1 | .08 | " | .08¼ |
| New Light Flannelettes | .06 | " | .06¼ |
| Canton Flannel, Bleached | .08¼ | " | .08½ |
| Underwear Cutters, Bleached | .08 | " | .08¼ |
| Silesias No. 1 | .04½ | " | .05 |
| New Black Silesias | .03½ | " | .04 |
| Red Cotton Cuttings | .03½ | " | .04 |
| Soft Unbleached | .08¼ | " | .08½ |
| Blue Cheviots | .04¼ | " | .05 |
| Fancy | .02¾ | " | — |
| Washable | .01¾ | " | — |
| Cottons—According to Grades— | | | |
| Blue Overalls | — | " | .03½ |
| New Black, Soft | .03¾ | " | .04 |
| Khaki Cuttings | .02¼ | " | .02½ |
| O. D. Khaki | .02½ | " | .03¼ |
| Corduroy | .02 | " | .02¾ |
| New Canvas | .06 | " | .06½ |
| B. V. D. Cuttings | .07¼ | " | .08 |

## Domestic Rags (Old)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| White No. 1— | | | |
| Repacked | 3.80 | @ | — |
| Miscellaneous | 3.20 | " | — |
| White No. 2— | | | |
| Miscellaneous | 2.65 | " | — |
| Twos and Blues, Repacked | 2.20 | " | — |
| Old Blue Overalls | 2.25 | " | 2.50 |
| Thirds and Blues, Repacked | 2.20 | " | — |
| Miscellaneous | 1.80 | " | — |
| Black Stockings | 3.50 | " | 4.00 |
| Roofing Stock— | | | |
| No. 1 | 1.55 | " | — |
| No. 2 | 1.45 | " | — |
| No. 3 | 1.35 | " | — |
| No. 4 | 1.35 | " | — |
| No. 5, Quality A | 1.35 | " | — |
| Quality B | 1.20 | " | — |
| Quality C | .95 | " | — |
| Old Manila Rope | 5.75 | " | — |

* OPA Maximum Prices.

## Foreign Rags

(F. o. b. Boston)

| | |
|---|---|
| Canvas | (nominal) |
| Dark Cottons | (nominal) |
| Dutch Blues | (nominal) |
| New Checks and Blues | (nominal) |
| Old Fustians | (nominal) |
| Old Linsey Garments | (nominal) |
| New Silesias | (nominal) |

# CHICAGO

## Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices.

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White Envelope Cuts, one cut | 3.37½ | " | — |
| No. 1 Hard White Shavings, unruled | 2.50 | " | — |
| No. 1 Soft White Shavings | 2.50 | " | — |
| No. 1 White Ledger | 2.17½ | " | — |
| No. 1 Heavy Books & Magazines | 1.57 | " | — |
| White Blank News | 1.65 | " | — |
| Mixed Kraft Env. & Bag Cuttings | 2.75 | " | — |
| No. 1 Assorted Old Kraft | 1.75 | " | — |
| Overissue News | .85 | " | — |
| No. 1 News | .75 | " | — |
| No. 1 Mixed Paper | .70 | " | — |
| No. 1 Roofing Rags | 1.55 | " | — |
| No. 2 Roofing Rags | 1.45 | " | — |

## M. & O. to Ship Pulpwood by Rail

INTERNATIONAL FALLS, Minn., February 21, 1942—Adjusting its pulpwood hauling operations to conserve tires and truck equipment Minnesota and Ontario Paper Company will save 500,000 truck miles by using rail facilities this winter.

More than 30,000 cords of pulpwood, normally hauled directly to the company paper and insulite mills here will be landed at Camp 29, southern terminal of the Mando company's logging railway to load on cars for shipment.

The Mando tire-saving measure will be in keeping with government requests that industries make every endeavor to aid the war effort by sparing equipment and supplies needed elsewhere.